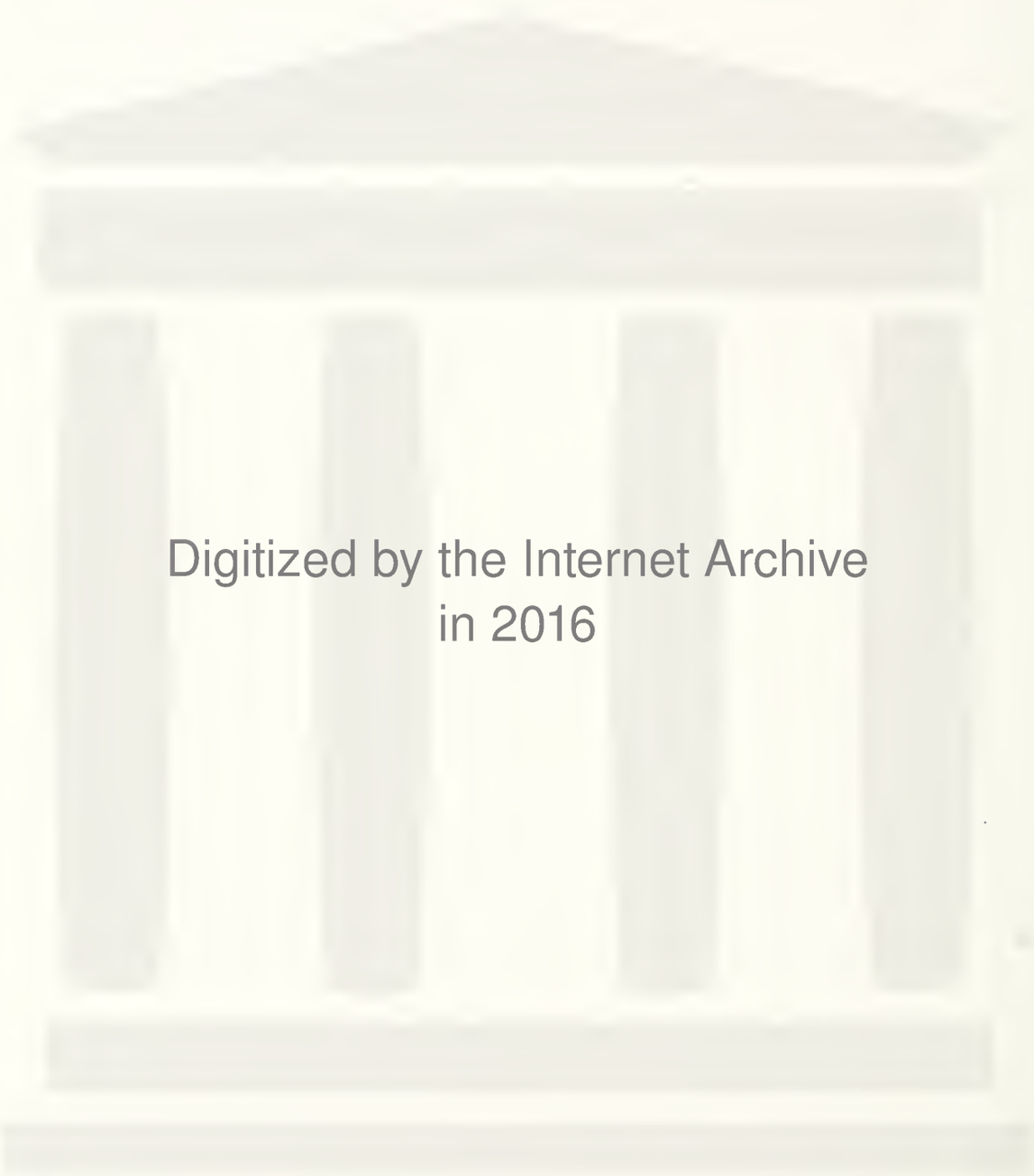


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Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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Second class postage paid at St. Paul, Minnesota and additional mailing offices. POSTMASTER. Send P.O. Form 3579 to: Minnesota Medicine, 101 East Fifth Street, St. Paul MN 55101.

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President's Letter



Confidentiality — Really?

Confidential — entrusted with private or secret matters. That's Webster's definition. Ever since the day of Hippocrates, we have been admonished by our predecessors, our teachers, and our peers in the medical profession, above all, to keep what we learn from our patients confidential. The one-on-one relationship between patient and physician is absolutely essential for good medical practice.

With the advent of third party payers, we have seen an ever insidious erosion of that confidentiality, and with it, an erosion of the trust and faith of patients for the medical profession. Is this a planned program to increase the distrust by the public of the individual physician? If one were paranoid enough, one might accept that thesis. I do not think it is this, but it is a natural consequence of letting the third party payer into deliberations between doctor and patient, because the third party pays the bills. Secondarily, of course, the patient still really pays the bill; either in the form of insurance premiums or taxes.

Our legislators have been worried about individual privacy rights, recognizing that with modern computer capabilities and the government owning tremendous amounts of personal information on all citizens that this information should indeed be treated with confidentiality.

Do legislators have reason to worry? An AP release in the middle of November discussing a six month study by a HEW Task Force cites the risk in computer systems: "Due to the nature of most HEW personal data, the team believes the potential is very high for both harm to individuals and fraudulent alteration of data if the management groups fail to enforce standards."

The Task Force also said: "Systems security in HEW was far from meeting minimum acceptable standards." HEW had standards — the average rate of compliance with the standards that do exist was less than 40%. DPW in Minnesota does not have standards set as of this writing. If they did exist, would the rate of compliance be better than 40%? We do not know.

The audit of HEW included the Social Security and the Health Care Financing Administrations. About ten months ago, SSA halted a plan to expand its computer network when it penetrated its own safeguard system in a test. At that time, two insurance companies handling medical payments had been equipped with terminals to give them access to Social Security Administration computer files, and similar terminals had been planned for fourteen other companies.

Revelations in this vein include the case of a Chicago-based research firm that allegedly advertised its ability to come up with unauthorized medical records which were sold to insurance companies. One such case involved observations of a retarded child. According to the District Attorney of Denver, Colorado, another firm provided not merely copies of the medical records but the original records themselves. The above citations come from an article written by M. Stanley Evans in the newspaper "Human Events," November 26, 1977 issue.

Let us cite one more example that we are all aware of: the inaccuracy of released data. HEW's released the names of doctors who received more than $100,000 in Medicare payments a year. That was proven by this Association to be a complete miscarriage of justice and accuracy. In fact, the Secretary of HEW issued a written apology for the misinformation and the problems it caused.

Is there then a need to restrict the availability of and

release of computerized data, especially that material available on government computer tapes?

My personal opinion is that there is a need to restrict "release," at least until standards have been drawn up, and those standards apply safeguards. Does the public, who foots the bill, have a right to know? If they feel this information should be released about people's medical records, then in all fairness, all personal medical records including their own should be made available to whomever seeks that information.

Confidentiality then is available only to those who pay their own bills. I personally feel that we, as doctors, have *too* often given up on principles that should have been held firm and have lost the respect of the public because of it. This is *one principle* that is *absolutely essential* to the *good practice of medicine.* Let's support it without reservations. Of course, the public has a right to know, but not when it interferes with the keystone of good medical practice.



C. A. Anderson, M.D.
President

Minnesota Medical Auxiliary Day at the Capitol

George Washington's birthday, February 22, 1978, has been set aside by the Auxiliary to tour the State Capitol, visit the Governor, and attend committee meetings. In addition, MMA President, Doctor Chester Anderson, Mr. Jim Sova, MMA lobbyist, Senator Jerome M. Hughes, Senator Nancy Brataas, and Mr. John Krichbaum of the AMA, will address the members on various topics of concern.

Watch the February issue for further details and time schedule.

Editor's Notebook

New Year's Revolutions

I have a confession to make. Because I was at a loss for words for this New Year's editorial, I asked minny, MINNESOTA MEDICINE's literary cockroach and insect laureate, what to say to start the year. Immediately minny hurled himself headdown on the keys and banged out this message with his brow:

say something
profound
philosophical
and revolutionary
that will show
doctors their
relative significance
among the spinning stars
and wheeling constellations
and whirling galaxies

tell them the earth
only revolves
around the sun
once each year
so the end of
one revolution
is just the
beginning of
another revolution

inform them
like other mortals
doctors run with
ever increasing
velocity in
concentric circles
until they get back
to the starting point

And let them know
every fourth year
they can take a small
leap forward to keep
up with the rest of
the human race
that is what
the whole show
is all about

minny

(continued)

Now I will confide minny's brow beating didn't help this editorial much, except to remind me sometimes you have to circle a point to grasp it. The point of this editorial is this: This next go around, we plan to stick to our goals. These goals are:

1. To stay within our budget by either expanding our advertising, keeping our issues leaner, or asking for more money. This last year, *viz* 1977, we will come in slightly over-budget, even though our number of editorial pages remained the same as 1976. In 1978, our strategy will probably be to increase advertising revenues, rather than to slim down or to significantly step up our budget requests. So far, omens are good. Our advertising revenues in January 1978 will be roughly twice those of January 1977.

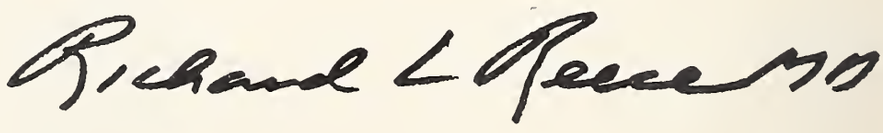
2. To give our readers what we think they like. This is partly guesswork, based on what the editors pick up by keeping their fingers in the wind, their noses in the air, their eyes on their goals, and their ears to the ground. But we also plan to base our editorial contents on results of a questionnaire we will be sending out soon. This questionnaire will sample your likes, dislikes, and wants; it will also serve as a marketing survey to give advertisers and editors an idea of how well read we are.

3. To bring to light the distinctive features of medicine in Minnesota. For example, in this issue, Dr. Robert Kelly* describes his experiences with medical students in the Rural Physician Associate Program. This program has succeeded admirably in bringing young physicians to the rural sections of this state. Of the University of Minnesota students who have participated and completed the program, 78% have returned to rural areas and 68% to the specific area where they served their preceptorship. Also, Minnesota is distinctive in that it has a large number of group practices and health maintenance organizations. In future issues, we shall elaborate on the role of these organizations.

4. To serve as a means of your professional education. Ideally we like our articles to blend academic and practical considerations. We want articles to be original, useful, and analytic. Also the articles should contain information that is applicable to your problems. If, in meeting these criteria, the article generates humor and excitement, so much the better.

5. To inform you what is going on in the worlds of politics, government, and medicine. This information will take these forms: (a) monthly articles from the Socio-economic Department; (b) periodic reports of the progress of the Cost Containment Commission; (c) interviews with English and Canadian physicians, now practicing here, on their views of their native countries' health systems; with Minnesota Medical Association officers; with members of the Press; with practicing physicians in rural, suburban, and inner cities; and with hospital administrators and officials of Health Maintenance Organizations.

The Board of Editors joins minny and me in wishing you a Happy New Year.



*See page 43.

Vitrectomy in Diabetics with Renal Failure and Kidney Transplantation

IRA A. PRILUCK, M.D.*† and DAVID E. EIFRIG, M.D.*

Vitrectomy provides a new surgical modality in the treatment of patients with vitreous hemorrhage secondary to proliferative diabetic retinopathy. Severe nephropathy can be effectively managed by renal transplantation prior to the vitrectomy procedure. Three cases are presented of diabetic patients who underwent successful renal transplant and vitrectomy. Resolution of vitreal hemorrhage was accomplished in all cases (six eyes); in two patients a marked improvement of visual acuity was attained.

THE PATIENT WITH diabetes mellitus and the complicating problems of proliferative retinopathy, nephropathy, neuropathy, and peripheral vascular disease represents a major therapeutic challenge. Diabetic retinopathy is responsible for approximately 10% of new blindness at all ages and causes 20% of new blindness between ages 45 and 74 years.[1] The average patient survival following the onset of blindness is approximately five to six years.[2]

A significant number of deaths in patients with juvenile onset diabetes between the ages of 30 and 40 years are caused by end-stage renal disease.[3] There appears to be a general improvement in diabetic survival as newer therapeutic modalities are introduced such as renal transplantation. Renal transplantation has demonstrated efficacy in the management of diabetic patients with glomerulosclerotic renal insufficiency.[4] With recent medical and technological advances in the management of diabetic patients with marked visual limitations, a new hope exists for improved quality of life. This paper reports three blind diabetic patients with uremia who underwent renal transplantation and successful vitrectomy.

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Supported by USPHS EY00027 (Training Grant).
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Case Reports

Case 1

A 38-year-old man with a 24-year history of diabetes mellitus was first seen at our clinic in February, 1973. Examination revealed grade 4 diabetic retinopathy in both eyes and vision of 20/50 bilaterally. In 1969, he underwent a hypophysectomy and in May, 1973, a renal transplant. He had received laser therapy elsewhere in 1971. In July, 1973, the patient had bilateral vitreous hemorrhages with subsequent vision of hand movements in each eye. The patient underwent vitrectomies of his right eye in October, 1974, and of his left eye in April, 1975. Postoperative vision has remained 20/60 in each eye.

Case 2

A 31-year-old man with a 21-year history of diabetes mellitus was started on hemodialysis in December, 1970, and in May, 1971, was given a renal transplant. An eye examination in December, 1970, revealed the vision to be 20/40, right eye, and 20/20, left eye, with early postsubcapsular cataractous changes bilaterally as well as proliferative retinopathy. The vision fell to 20/300, right eye, and hand movements, left eye in April, 1971, secondary to vitreous hemorrhage. In May, 1973, the vision was hand movements, right eye, and light perception, left eye. In December, 1974, the patient developed renal failure and had a transplant.

In July, 1974, the patient had a vitrectomy and lensectomy in each eye. Postoperatively, the retina was found to be centrally detached and atrophic in both eyes. Final visual result has been hand movements, right eye, and light perception, left eye. Examination revealed 20/20 media, the poor visual result is consistent with the atrophic condition of the retina.

Case 3

A 36-year-old woman with a 21-year history of diabetes received laser therapy of the right eye in 1968 and of the left eye in 1971. In 1973, her vision was recorded as light perception bilaterally. Initial eye examination at our clinic revealed bilateral light perception vision, early postsubcapsular catarctous changes, and old, well

TABLE

Results of Vitrectomies Following Renal Transplantation for Severe Glomerulosclerosis

Case No.	Age/yr	Sex	Eye	Visual Acuity		Complications	Comment	Follow-up
				Preoperative	Postoperative			(Mos.)
1	38	M	OD	H.M.*	20/60	none	patient returned	18
			OS	H.M.	20/60	none	to work	23
2	31	M	OD	20/300	H.M.	none	atrophic retina	20
			OS	H.M.	L.P.†	none	limits vision	20
3	36	F	OD	L.P.	20/40	none	returned to	26
			OS	L.P.	20/25	none	normal activities	18

*H.M. = hand movements
†L.P. = light perception

organized, vitreous hemorrhages. She received a renal transplant in January, 1974.

In February, 1974, she had a vitrectomy and lensectomy, left eye. Postoperatively, she had episodes of increased intraocular pressure, which was well controlled with phospholine iodide. Follow-up vision has remained at 20/25, left eye, and funduscopic examination revealed involutional diabetic retinopathy. The right eye has since undergone vitrectomy and lensectomy with a similar result.

Results

The results of six vitrectomies performed in three diabetic patients following renal transplantation for severe glomerulosclerosis are summarized in the Table. In all cases, an uneventful pars plana vitrectomy with or without a lensectomy was performed.

No operative complications, such as retinal dialysis, corneal trauma, or retinal hole formation, were encountered in the cases presented. The nonrhegmatogenous retinal detachment in Case 2 is indicative of the longstanding, severe proliferative diabetic retinopathy.

All patients had ophthalmic surgical procedures performed under local anesthesia, using the Douvas roto-extractor with a fiberoptic light, fundus contact lens, and operating microscope. In all cases, vitreous hemorrhage and fibroplastic membranes were removed as well as the cutting of vitreoretinal traction bands, where indicated. Removed vitreal contents were replaced with Ringer's solution.

Comment

New surgical technology, including vitrectomy and renal transplant, offers improved quality of life to patients with advanced diabetic complications. This advanced technology encourages the successful management of nephropathy and retinopathy. Simmons et al. have reported 31 of 40 diabetic patients (78%) who have undergone renal transplantation are alive in a four year follow-up period.[5] In recent years, vitreous surgery using a pars plana approach has become widely practiced. Vitrectomy instrumentation,[6–9] techniques,[10,11] and indications[12] have been described. Pars plana vitrectomy has been shown to contribute to improved visual acuity in diabetic patients,[13] as well as in patients with other vitreal problems.[14]

Vitrectomy provides a new modality as a surgical approach for a previously inoperable ocular disease, vitreous hemorrhage. The presence of renal hypertension and uremia need not be contraindications to the management of patients with vitreous hemorrhages secondary to proliferative diabetic retinopathy. Final visual acuity improvement is dependent upon a technically successful operation and on the basic integrity of the retina. If the retina is functionally intact, removal of vitreal opacities from the pupillary axis will result in improved vision. Unfortunately, there are no definitive means to accurately evaluate retinal function preoperatively in the presence of dense vitreal opacities. However, B-scan ultrasound and bright flash electroretinogram provide useful preoperative information regarding retinal integrity.

Summary

Vitrectomy offers a new dimension in the management of blind diabetic patients with severe vitreous hemorrhages. Severe medical complications as hypertension, electrolyte imbalance, proteinuria, and uremia can be successfully managed by renal transplantation and need not militate the use of vitrectomy as a therapeutic approach to vitreal hemorrhage. The three patients presented, who successfully underwent renal transplantation and vitrectomy, lend credence to the efficacy of these therapeutic procedures.

*References will be found on page 36.

Use of Ultrasound in Focal Hepatic Defects

A Case Report of an Amebic Abscess

JOHN BJORGEN, M.D.*† and DARYL WILLIAMSON, M.D.*‡

An isolated defect on a radionuclide liver scan is not an unusual occurrence. This case demonstrates the value of a second non-invasive technique, ultrasound scanning, in evaluating this defect. A purely cystic lesion strongly favors a non-neoplastic process.

ULTRASOUND SCANNING has proven useful in evaluating focal cold defect found on a radionuclide liver scan, e.g., differentiation of congenital hepatic cyst[1] abscess[2] and anatomical variants[3] from neoplastic disease. We are reporting a case in which ultrasound was helpful in diagnosing and managing an asymptomatic amebic abscess.

Case Report

A 27-year-old male was admitted to St. Paul-Ramsey Hospital in April, 1976, for the evaluation of right upper quadrant pain with tenderness and a low grade fever of four days' duration. The physical examination was otherwise negative. The patient had an episode of diarrhea while he was in Vietnam in 1969, but evaluation for amebiasis then was negative. On discharge from the military service, he had negative proctoscopic and stool examinations for amebiasis. From 1969 to the time of admission he had lived entirely in Wisconsin and Minnesota. Four days after admission to the hospital his symptoms had subsided. The right upper quadrant pain was thought to represent muscle strain.

The SGOT was 31 IU/L (N = 6-24 IU/L); and the alkaline phosphatase, 107 IU/L (N = 15-100 IU/L). The hemoglobin was 12 gm.%. The serum albumin was slightly decreased at 3.12 gm. %.

The upper gastrointestinal series, intravenous urogram, oral cholecystogram, and levels of serum bilirubin, fluoroscent antinuclear antibodies, white blood cell and differential counts, hepatitis associated antigen, serum and urine amylase, blastomycosis titer, and echinococcus titer were normal. Stool smears for ova and parasites and culture for pathogens were negative. The serum indirect hemagglutinin titer for entameba histolytica as determined by the Minnesota State Board of Health was 1:4096 (diagnostic titer 1:128). The elevated titer was confirmed by another laboratory.

A 99mTc sulfur colloid liver scan disclosed a 5 cm. round cold

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Research for this paper was partially supported by funds from: The Medical Education and Research Foundation of St. Paul-Ramsey Hospital, 640 Jackson Street, St. Paul, Minnesota 55101.

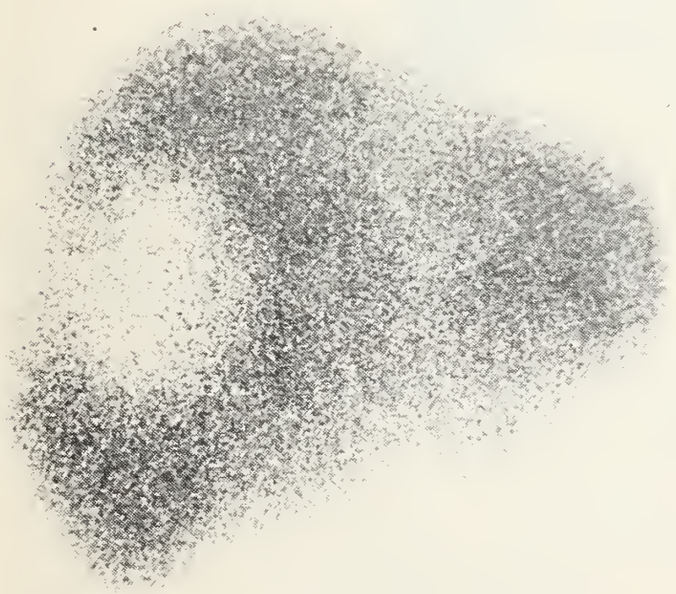


Fig. 1 — Anterior liver scan with a round focal area of decreased uptake, right lobe.

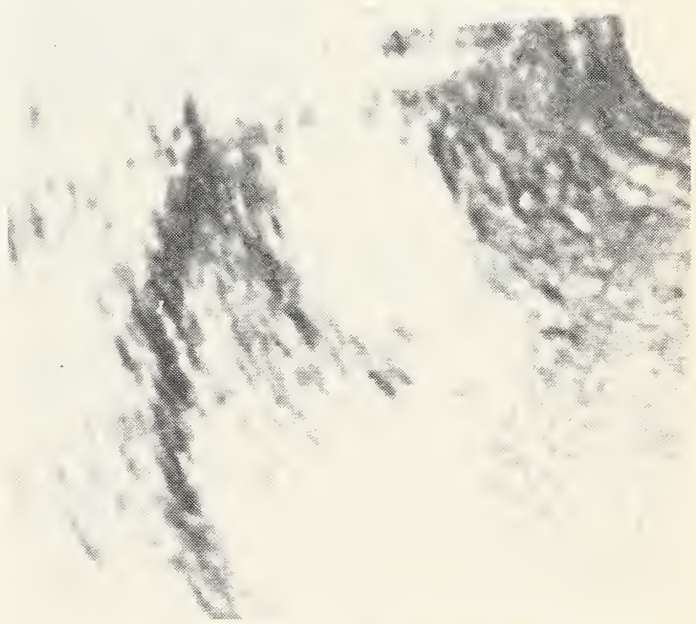


Fig. 2 — Longitudinal gray scale ultrasound scan 10 cm. to the right of midline shows an ovoid anechoic area with an intense back wall echo typical for a cyst.

area in the right lobe of the liver (Figure 1). An ultrasound scan showed this process to be free of echoes, having the appearance of a cystic lesion.

A probable diagnosis of amebic abscess was made and the patient treated with Flagyl® (metronidazole) 750 mgm. three times daily for ten days. In two weeks, the lesion had decreased 30% in size on radionuclide and ultrasound scanning. Eleven weeks after treatment both the radionuclide and the ultrasound scans were normal. The patient was doing well 12 months later.

Discussion

Amebic abscess of the liver involves the right lobe in 90% of the cases and generally afflicts young adult males. There is usually a mild to moderate elevation of the serum alkaline phosphatase. It may present itself insidiously, over a period of months, in the form of a low grade fever with weakness, weight loss, and discomfort over the hepatic area. Alternately, the onset may be acute, with high spiking temperatures and an enlarged, tender liver.[4]

The time from intestinal infestation to the development of the hepatic abscess may be as long as 25 years. Four cases of amebic liver abscess in Vietnam veterans occurring more than 12 months after exposure have been reported.[5]

In the present case, the nature of the radionuclide scan defect was initially uncertain because of the remote exposure to the protozoa, and a malignant process was considered. After the ultrasonic examination showed an anechoic cystic lesion, an inflammatory process was thought to be more likely, and angiography and biopsy were, therefore, withheld.

Anti-amebic hemagglutinin titers are useful as a screening procedure but may indicate only previous invasive amebic disease and not necessarily active amebiasis.[6] Because of the ultrasound findings in this patient, a diagnostic and therapeutic trial with Flagyl® was instituted.[7] Subsequent resolution of the lesion ruled out other diagnostic possibilities such as congenital cyst, hemangioma, and bacterial abscess.

References

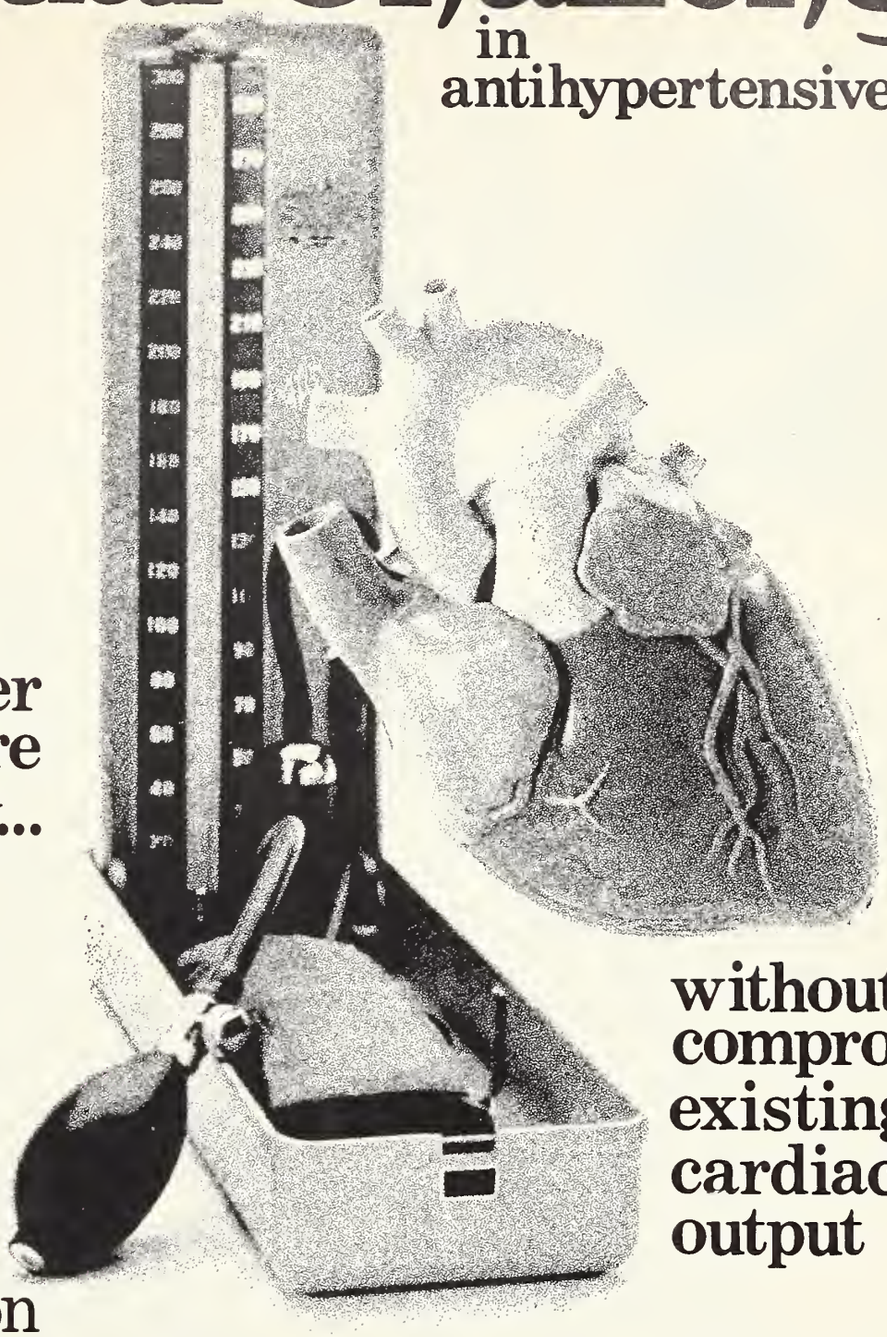
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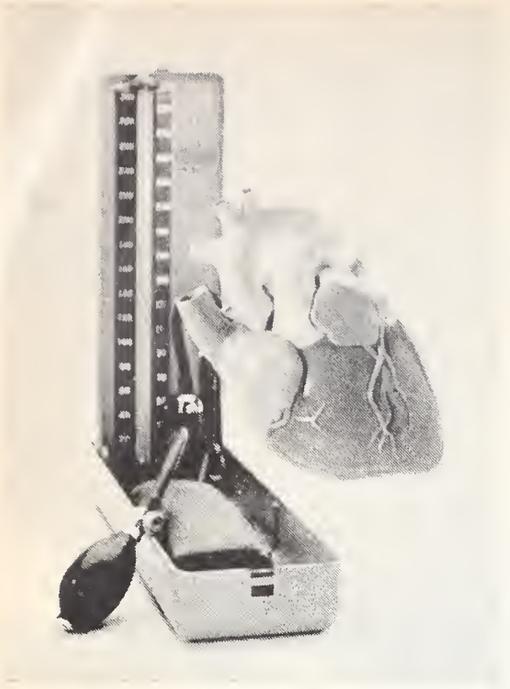
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It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. For more details see the brief summary of prescribing information.

For a brief summary of prescribing information, please see following page.

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Warnings: It is important to recognize that a positive Coombs test, hemolytic anemia, and liver disorders may occur with methyldopa therapy. The rare occurrences of hemolytic anemia or liver disorders could lead to potentially fatal complications unless properly recognized and managed. Read this section carefully to understand these reactions.

With prolonged methyldopa therapy, 10% to 20% of patients develop a positive direct Coombs test, usually between 6 and 12 months of therapy. Lowest incidence is at daily dosage of 1 g or less. This on rare occasions may be associated with hemolytic anemia, which could lead to potentially fatal complications. One cannot predict which patients with a positive direct Coombs test may develop hemolytic anemia. Prior existence or development of a positive direct Coombs test is not in itself a contraindication to use of methyldopa. If a positive Coombs test develops during methyldopa therapy, determine whether hemolytic anemia exists and whether the positive Coombs test may be a problem. For example, in addition to a positive direct Coombs test there is less often a positive indirect Coombs test which may interfere with cross matching of blood.

At the start of methyldopa therapy, it is desirable to do a blood count (hematocrit, hemoglobin, or red cell count) for a baseline or to establish whether there is anemia. Periodic blood counts should be done during therapy to detect hemolytic anemia. It may be useful to do a direct Coombs test before therapy and at 6 and 12 months after the start of therapy. If Coombs-positive hemolytic anemia occurs, the cause may be methyldopa and the drug should be discontinued. Usually the anemia remits promptly. If not, corticosteroids may be given and other causes of anemia should be considered. If the hemolytic anemia is related to methyldopa, the drug should not be reinstituted. When methyldopa causes Coombs positivity alone or with hemolytic anemia, the red cell is usually coated with gamma globulin of the IgG (gamma G) class only. The positive Coombs test may not revert to normal until weeks to months after methyldopa is stopped.

Should the need for transfusion arise in a patient receiving methyldopa, both a direct and an indirect Coombs test should be performed on his blood. In the absence of hemolytic anemia, usually only the direct Coombs test will be positive. A positive direct Coombs test alone will not interfere with typing or cross matching. If the indirect Coombs test is also positive, problems may arise in the major cross match and the assistance of a hematologist or transfusion expert will be needed.

Fever has occurred within first 3 weeks of therapy, occasionally with eosinophilia or abnormalities in liver function tests, such as serum alkaline phosphatase, serum transaminases (SGOT, SGPT), bilirubin, cephalin cholesterol flocculation, prothrombin time, and bromsulphalein retention. Jaundice, with or without fever, may occur, with onset usually in the first 2 to 3 months of therapy. In some patients the findings are consistent with those of cholestasis. Rarely fatal hepatic necrosis has been reported. These hepatic changes may represent hypersensitivity reactions; periodic determination of hepatic function should be done particularly during the first 6 to 12 weeks of therapy or whenever an unexplained fever occurs. If fever and abnormalities in liver function tests or jaundice appear, stop therapy with methyldopa. If caused by methyldopa, the temperature and abnormalities in liver function characteristically have reverted to normal when the drug was discontinued. Methyldopa should not be reinstituted in such patients.

Rarely, a reversible reduction of the white blood cell count with primary effect on granulocytes has been seen. Reversible thrombocytopenia has occurred rarely. When used with other antihypertensive drugs, potentiation of antihypertensive effect may occur. Patients should be followed carefully to detect side reactions or unusual manifestations of drug idiosyncrasy.

Pregnancy and Nursing: Use of any drug in women who are or may become pregnant or intend to nurse requires that anticipated benefits be weighed against possible risks; possibility of fetal injury or injury to a nursing infant cannot be excluded. Methyldopa crosses the placental barrier, appears in cord blood, and appears in breast milk.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: urinary uric acid by the phosphotungstate method, serum creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Stop drug if involuntary choreoathetotic movements occur in patients with severe bilateral cerebrovascular disease. Patients may require reduced doses of anesthetics; hypotension occurring during anesthesia usually can be controlled with vasopressors. Hypertension has recurred after dialysis in patients on methyldopa because the drug is removed by this procedure.

Adverse Reactions: *Central nervous system:* Sedation, headache, asthenia or weakness, usually early and transient; dizziness, lightheadedness, symptoms of cerebrovascular insufficiency, paresthesias, parkinsonism, Bell's palsy, decreased mental acuity, involuntary choreoathetotic movements; psychic disturbances, including nightmares and reversible mild psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angina pectoris. Orthostatic hypotension (decrease daily dosage). Edema (and weight gain) usually relieved by use of a diuretic. (Discontinue methyldopa if edema progresses or signs of heart failure appear.)

Gastrointestinal: Nausea, vomiting, distention, constipation, flatus, diarrhea, mild dryness of mouth, sore or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundice, liver disorders.

Hematologic: Positive Coombs test, hemolytic anemia. Leukopenia, granulocytopenia, thrombocytopenia. Positive tests for antinuclear antibody, LE cells, and rheumatoid factor.

Allergic: Drug-related fever, lupus-like syndrome, myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlargement, gynecomastia, lactation, impotence, decreased libido, dermatologic reactions including eczema and lichenoid eruptions, mild arthralgia, myalgia.

Note: Initial adult dosage should be limited to 500 mg daily when given with antihypertensives other than thiazides. Tolerance may occur, usually between second and third months of therapy; increased dosage or adding a diuretic frequently restores effective control. Patients with impaired renal function may respond to smaller doses. Syncope in older patients may be related to increased sensitivity and advanced arteriosclerotic vascular disease; this may be avoided by lower doses.

How Supplied: Tablets, containing 125 mg methyldopa each, in bottles of 100; Tablets, containing 250 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 1000; Tablets, containing 500 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 500.

For more detailed information, consult your MSD representative or see full prescribing information.

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Case Report

Pulmonary Atheroembolism Complicating Repair of an Atherosclerotic Abdominal Aneurysm

C.E. WEIGENT, M.D.*

Of the many types of pulmonary embolism described, atheroembolism is not included[1]. Embolism of this type would require a connection between the arterial and systemic venous circulation.

A distinct syndrome has been reported in association with spontaneous abdominal aortocaval fistula secondary to an atherosclerotic aneurysm of the abdominal aorta. The precipitous course of events following such an occurrence is contrasted with the relatively benign course usually associated with a tramatic aortocaval fistula[2].

The following case of pulmonary atheroembolism is reported because it represents a complication of aortocaval fistula not previously described.

The patient was a 76-year-old man admitted to the hospital with a history of severe right flank and right lower quadrant abdominal pain of 24 hours duration. He was hypotensive and had a pulse of 116 per minute. Physical examination revealed guarding in the right lower quadrant and a pulsatile mass in the mid abdomen. A bruit was audible over the mass.

The patient was taken to surgery, and a 7 cm. in diameter atherosclerotic aneurysm of the abdominal aorta beginning below the renal arteries was found. A tear was noted in the side of the aneurysm through which venous blood was noted to be coming. The aortocaval fistula was closed with sutures through the wall of the aneurysm. The aneurysm was partially resected, leaving the posterior wall and a dacron bifurcation graft placed end to end to the aorta and end to side to the external iliac vessels.

The post operative course was stormy with intermittent bouts of respiratory distress and a persistently low arterial p02 even while the patient was on a respirator. A tracheostomy was performed on the fourth post-operative day. The respiratory distress continued, and on the twelfth hospital day, the patient became markedly diaphoretic and agitated. The blood pressure fell to 90/50, and urine output decreased. After an initial response to treatment, the patient again became hypotensive and died following cardiac arrest on the fifteenth hospital day.

*Staff Pathologist, Minneapolis Veterans Administration Hospital and Assistant Professor of Pathology and Laboratory Medicine, University of Minnesota.

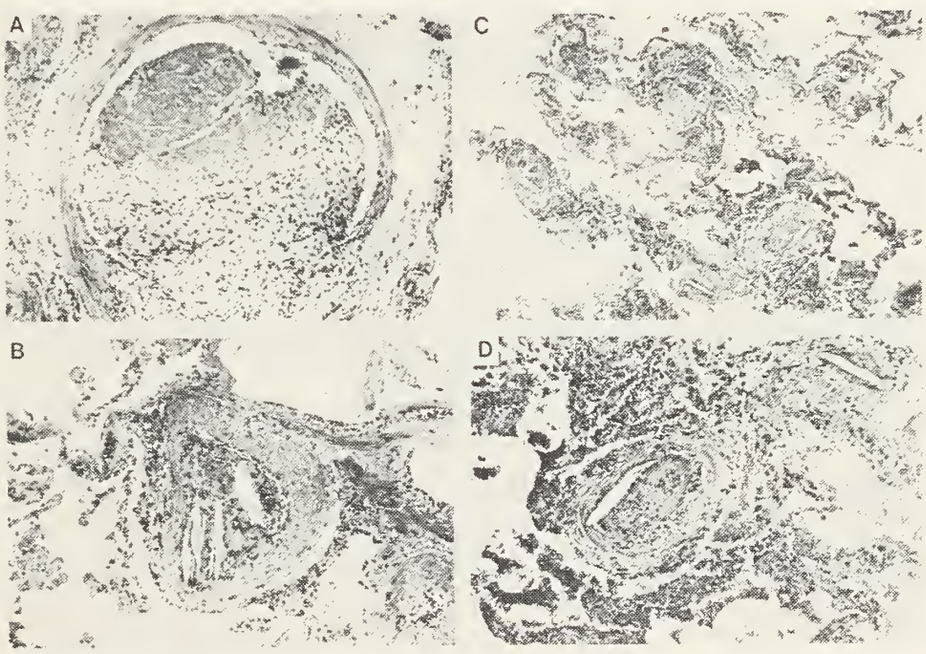


Figure — Atherosclerotic plaque emboli in small pulmonary artery branches. Note foam cells as well as cholesterol clefts in A. Note alveolar hemorrhage in C and D.

Pathological Findings

At autopsy, the aorto-iliac graft was securely in place and the defect in the vena cava was closed with interrupted sutures. The operative site was surrounded by hematoma and there was organizing hematoma in the retroperitoneal space. The remaining abdominal aorta showed severe ulcerative atherosclerosis. The resected portion of the atherosclerotic aneurysm contained thrombus and atheromatous debris.

The right lung weighed 950 grams, the left lung 720 grams. The apical segments showed moderate emphysematous changes and the dependent portions were dark red and subcrepitant. No pulmonary emboli were found in branches of the pulmonary arteries. Microscopically, there was edema, congestion, focal hemorrhage and collections of pigmented macrophages in alveoli. The striking finding was the large number of atherosclerotic plaque emboli in small pulmonary arteries and arterioles (Figure). The atherosclerotic plaque embolism was widespread throughout both lungs.

The heart weighed 510 grams. There was severe coronary atherosclerosis. The left anterior descending branch and the circumflex branch of the left coronary artery were focally narrowed up to 90% of their lumina. The right coronary artery was completely occluded by atherosclerotic change at a point 5.0 cm. from its origin. There was acute myocardial infarction involving the lower one-half of the posterolateral wall of the left ventricle and apex with beginning neutrophilic infiltration. Patchy areas of old scarring were found in sections of the left ventricle.

Several atherosclerotic plaque emboli were found in small arteries in the spleen and in periadrenal and periprostatic vessels. Only one athero-embolus was found in six large sections of the kidneys. The right kidney weighed 205 grams, the left kidney 170 grams. They were red-brown, soft and showed prominent hyaline and hydropic tubular degeneration.

Other findings included early central hepatic necrosis and erythroid hyperplasia of the vertebral marrow.

Discussion

The widespread pulmonary atheroembolism could explain the hypoxemia and respiratory distress occurring throughout the post-operative period. This in turn along with the severe coronary atherosclerosis is postulated as the cause of the acute myocardial infarct which was the terminal event. While it is difficult to date the onset of the atheroembolism from the history available, it is conceivable that manipulation of the aneurysm during surgical repair with an aortocaval fistula may have accounted for considerable atheroembolism occurring at that time. It is suggested that the possibility of this complication be borne in mind during the repair of abdominal atherosclerotic aneurysms in the presence of an aortocaval fistula.

Case Summary

The case of a 76-year-old man who developed widespread pulmonary atheroembolism following the repair of an atherosclerotic aneurysm of the abdominal aorta with an aortocaval fistula is reported.

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The Board of Editors of MINNESOTA MEDICINE invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of MINNESOTA MEDICINE. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of MINNESOTA MEDICINE, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
Cover Editor



Vertigo spoils the view.

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Effective: Management of nausea and vomiting and dizziness associated with motion sickness.

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Final classification of the less than effective indications requires further investigation.

CONTRAINDICATIONS. Administration of Antivert (meclizine HCl) during pregnancy or to women who may become pregnant is contraindicated in view of the teratogenic effect of the drug in rats.

The administration of meclizine to pregnant rats during the 12-15 day of gestation has produced cleft palate in the offspring. Limited studies using doses of over 100 mg./kg./day in rabbits and 10 mg./kg./day in pigs and monkeys did not show cleft palate. Congeners of meclizine have caused cleft palate in species other than the rat.

Meclizine HCl is contraindicated in individuals who have shown a previous hypersensitivity to it.

WARNINGS. Since drowsiness may, on occasion, occur with use of this drug, patients should be warned of this possibility and cautioned against driving a car or operating dangerous machinery.

Usage in Children: Clinical studies establishing safety and effectiveness in children have not been done; therefore, usage is not recommended in the pediatric age group.

Usage in Pregnancy: See "Contraindications."

ADVERSE REACTIONS. Drowsiness, dry mouth and, on rare occasions, blurred vision have been reported.

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Contraindicated: Known hypersensitivity to the drug. Children under 6 months of age. Acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: Not of value in psychotic patients. Caution against hazardous occupations requiring complete mental alertness. When used adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increased dosage of standard anticonvulsant medication; abrupt withdrawal may be associated with temporary increase in frequency and/or severity of seizures. Advise against simultaneous ingestion of alcohol and other CNS depressants. Withdrawal symptoms (similar to those with barbiturates and alcohol) have occurred following abrupt discontinuance (convulsions, tremor, abdominal and muscle cramps, vomiting and sweating). Keep addiction-prone individuals under careful surveillance because of their predisposition to habituation and dependence.

***Usage in Pregnancy:* Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.**

Precautions: If combined with other psychotropics or anticonvulsants, consider carefully pharmacology of agents employed; drugs such as phenothiazines, narcotics, barbiturates, MAO inhibitors and other antidepressants may potentiate its action. Usual precautions indicated in patients severely depressed, or with latent depression, or with suicidal tendencies. Observe usual precautions in impaired renal or hepatic function. Limit dosage to smallest effective amount in elderly and debilitated to preclude ataxia or oversedation.

Side Effects: Drowsiness, confusion, diplopia, hypotension, changes in libido, nausea, fatigue, depression, dysarthria, jaundice, skin rash, ataxia, constipation, headache, incontinence, changes in salivation, slurred speech, tremor, vertigo, urinary retention, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity, insomnia, rage, sleep disturbances, stimulation have been reported; should these occur, discontinue drug. Isolated reports of neutropenia, jaundice; periodic blood counts and liver function tests advisable during long-term therapy.

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* **Warning**
This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

* **Indications:** When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. (See Box Warning.) Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes.

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

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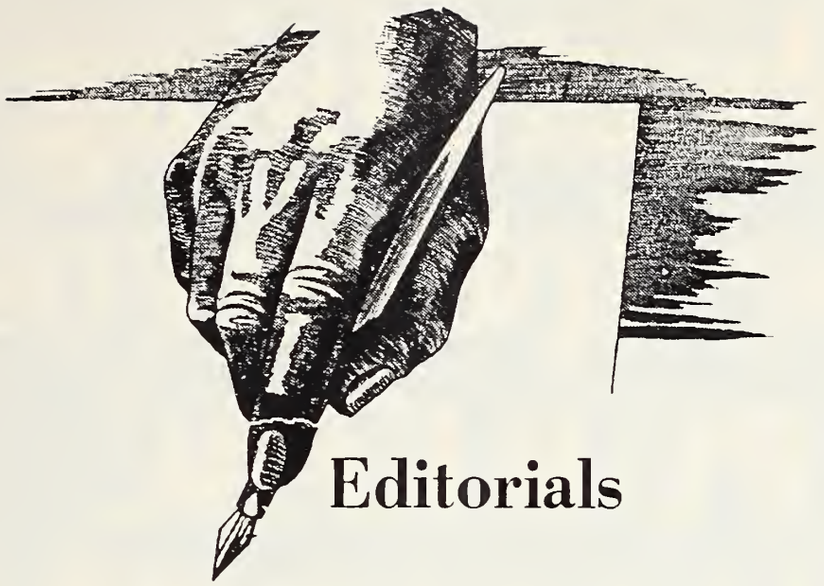
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Editorials

Beware of the Manipulative Patient

THE USUAL IMAGE of a doctor is that of a strong minded, independent, assertive, and controlling individual. It was, therefore, a surprise to me to discover how often members of the medical profession assume an entirely different role in the patient relationship. The situation I am describing is subtle, and unless the physician is aware of its frequency, he will be drawn into it repeatedly, without realizing what is happening.

We are trained in the scientific methodology to believe that every symptom that the patient describes to us requires a formal title. If we can not formulate an impressive diagnosis at the patient's first visit, we tend to think that there is a lack of ability on the part of the doctor. This compulsion to make an impressive diagnosis is enhanced by the doctor's fear of missing an obscure disease or injury. The doctor is sure that the public is convinced that a lack of an instant dignified diagnosis is a direct reflection on the doctor's ability and knowledge. Conversely, the act of making an instant impressive diagnosis is felt to prove that the patient is in the presence of a superior doctor. Often, we tend to obfuscate things by concocting words that describe symptoms which the patient already told us he had when he came into the office: i.e. erythema, pruritus, edema, anorexia, effusion, etc. The doctor tends to think that a polysyllable diagnosis is more impressive than a monosyllable diagnosis. Usually at this point the doctor is not thinking in terms of disability at work, or testifying at an industrial hearing or jury trial. In his zeal to impress the patient with his own diagnostic skill, he tends to forget that he may be required to testify under oath or fill out multiple insurance forms regarding the veracity of his diagnosis.

Patients and their attorneys consciously or subconsciously use this diagnostic compulsion to further their own goals. It is self evident that a person with a disease or injury is limited in his ability to perform a productive job. There are potential financial rewards for a person having a disabling disease or injury. It is not difficult to realize that a person who presents himself at a physician's office with a complaint of pain, will come out as a patient with a dignified and impressive diagnosis. The patient can take his newly obtained diagnosis such as internal derangement of the knee, slipped disc, or migraine headaches to his insurance company or his attorney and be rewarded in terms of compensation or time off of work. As soon as the doctor utters an impressive diagnosis for a vague pain that has not been confirmed by objective findings, or tests, the doctor becomes drawn into the patient's manipulations. He becomes forced to defend a diagnosis he has casually used as a medical catch-all. The legal connotation of such a

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diagnosis may be entirely different than the doctor intended.

When a doctor sees a new patient with a complaint of vague pain, he must do a complete medical examination and laboratory work-up to rule in or rule out an organic cause for the patient's symptoms. In cases of absence of objective findings in the clinical and laboratory examination a benign diagnosis can be made such as muscle strain, joint sprain, or contusion. He can then inform the patient, that whatever is causing his symptoms is no immediate threat to his life or limb. The patient can be allowed to work within the limits set for him by the pain. No complicated diagnosis need be made at this time. Symptomatic care in the form of heat, physical therapy, whirlpool, and medication for pain can be prescribed. The patient can be re-evaluated at regular intervals to be sure that there are no underlying obscure conditions. The patient should be advised to come in voluntarily, should there be a change in his symptoms. By avoiding a complicated diagnosis the doctor does not allow himself to be manipulated by the patient or his attorney and can maintain his position of impartial concerned clinician. He should not be afraid to say that the symptoms are out of proportion to the objective findings.

Formal treatment for an indefinite period of time is not necessary in the treatment of tendonitis, bursitis, sprain, or contusion. Maximum benefit in most of these conditions will be obtained after two months of physical therapy. The patient can then be informed that the symptoms will probably continue to improve up to a year from the time of their onset. Symptoms that last over one year will have to be considered permanent. The patient will have to learn to live within the limitations set by them. Most patients can accept that approach. By taking this position, the responsibility for the patient's symptoms is given back to where they ultimately belong. The doctor can align himself with the patient in the effort to treat his pain, but the doctor obviously lacks superhuman power. The present state of diagnostic evaluation is not completely fine-tuned at this time to measure objectively small muscle or tendon tears, bursitis, or contusion, or early ruptured disc. However, if the condition is not severe enough to register on the usual and standard examination techniques, no medical crisis is present and only symptomatic care is necessary most of the time. The patient's life is not in danger and his extremity is not going to drop off. If he can not return to his former job, he can do temporary light work, until his symptoms subside. If his symptoms do not subside after a reasonable period of time, he will have to be retrained for work, which does not aggravate his symptoms. This approach seems more reasonable than putting a person on total disability and prescribing physical therapy for an indefinite period of time. In the situation I am describing, the patient chooses to make his condition totally disabling, when he is only partially disabled. Typically the condition lasts far beyond the usual period of time that other people take to heal. Typically, it will become apparent that the patient is trying to impress the doctor with the severity of his symptoms rather than get over them. The thrust of the patient's visit is directed at impressing the physician with the severity of his pain and obtaining the necessary reports for insurance and legal purposes.

To avoid being manipulated in this fashion, the doctor should be sympathetic but firm. Temporary partial disability or permanent partial disability is the proper position for the doctor to take. Empirically, if the condition lasts over three months, the patient should be retrained for another job that falls within the limits set for him by his symptoms.

Summary

Unless the Doctor is aware of the manipulative patient, he can find himself advocating total disability when only partial disability is intended. The Doctor can avoid this pit-fall by taking a firm position advocating partial disability in musculoskeletal disorders.

Evan S. Ellison, M.D.
Minneapolis, Minnesota

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Giardiasis in Minnesota

GIARDIA LAMBLIA was last reviewed on these pages in July, 1969†. At that time the recommended treatment was Atabrine® at a dosage of .1g t.i.d. for five days in adults, half the dose for children. Subsequently, Flagyl® became the accepted treatment on the basis of clinical experience and a general recognition of Flagyl's® fewer side-effects relative to Atabrine®. However, in 1975 *The Medical Letter*[1] presented an article indicating that Flagyl® may be carcinogenic. The State Health Department, following the lead of the Federal Center for Disease Control, shortly thereafter dropped its recommendation of Flagyl® use in treatment of Giardiasis. Nevertheless, Flagyl® has not been taken off the market by the FDA and proof of its carcinogenicity in man has not been shown.

With this background in mind the following treatment recommendations have been offered by the Minnesota State Health Department. Initial treatment in symptomatic cases should be with Atabrine®. Asymptomatic cases should be treated only if the patient has reported symptoms in the past (thus posing a threat of cyclic occurrence of symptoms), lives in close association with a persistent symptomatic case, or performs a job that may lead to institutional spread of the parasite (health workers and food handlers). In all cases, insistence on strict personal hygiene should be an integrative support of therapy. In persistent cases where no familial or water-borne spread is suspected, or in patients in which Atabrine® is contraindicated or not tolerated, Flagyl® can be used in a dosage of 250mg t.i.d. for seven to ten days, though some clinicians report success with a more concentrated regimen of twice or even three times the dosage over one-half or one-third the usual period. Much depends on individual tolerance to the drug. In intransigent cases the Health Department does not recommend more than two courses of Flagyl®, favoring instead a return to Atabrine®. They ask that physicians contact the Epidemiology Unit in Minneapolis in any unusual cases.

One final point is the number of follow-up stool specimens to be submitted (the State Laboratory does them as a service). At least three specimens collected over about a week should reveal the existence of *Giardia* cysts, if they are there, better than 80% of the time. One follow-up specimen, however, has only about a a 65% chance of being positive in an infected individual. Therefore, follow-up procedures after each treatment course should include the collection and submission of at least three stool specimens.

Harold Weiss, M.S., M.P.H.
Minneapolis, Minnesota

*See Minnesota Med 60:11:815, 1977.

†Mears, T., and Zinneman, H., "Giardia lamblia as Parasite in Humans"

Reference

1. Aaron, H. (Editor). Reference, Is Flagyl Dangerous? The Medical Letter, 17(13):53, 1975.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

March 31-April 4, 1978. 41st Annual New Orleans Graduate Medical Assembly.

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Student Loan Fund — Installment Plan

My life has been relatively untrammeled by misfortune. The privilege of being a physician, an American and the husband of a good woman, engaged in raising a brood of seven bright and exciting children has provided me with many challenges but with much happiness.

One and a half years ago the Minnesota Medical Association asked me to accept the task of heading a committee to raise funds in order to rescue the MMA Foundation Student Loan Fund from a severe financial crisis. The sudden conversion from professional prospect to professional fund raiser was not painless. Previously a blithe spirit happily relating with family and colleagues, I was suddenly a pilferer with his hand in the other fellow's wallet. The effort was a success. The Loan Fund was rescued so many were happy but gloom had descended on my life. The telephone rang less frequently, racquet ball opponents were harder to come by. When I would enter the doctor's lounge at St. Mary's Hospital a strange silence would come over the place. If I walked down Lowry Avenue North I could look two blocks ahead and see friends ducking into alleys. When I discovered that my dear wife of thirty-seven years had a little private bank account, I had a great idea! That is until she divined my intentions and advised me rather forcefully that this was her mad money and that if I continued to cast avaricious eyes on her secret fund I would find myself discussing certain private matters with her attorney in a court room!

In the midst of all this melancholy came a letter which restored my faith in the goodness of man. Any of you who know Ted Sweetser realize that he is a person of profound thought and action who lightheartedly expresses serious ideas. Here is his letter:

> Dear John:
>
> Enclosed is the first of several $_____ contributions, the receiving of which is contingent on your billing me on a quarterly basis for the others. I find it more easy to spread the various pledges around. While you are not apparently equipped for that it may be well worth your time since I am sure I am not alone in preferring to chip away rather than dump off large sums, probably based on the same mistrust that keeps us all buying disability policies. This will, of course, entail your buying a new $500 typewriter, hiring a secretary to handle all of the paper work, possibly renting her a car and also employing a liaison person to refer to the remainder of the state association staff. With any luck, you should break almost even — which is better than most of my pledges do.
>
> (The rest of us do, however, appreciate your doing all the work.)
>
> **Ted**

And, then my answer:

> Dear Ted:
>
> Thank you for your note and contribution. My wife has volunteered as secretary which brings down the overhead. We use the kitchen table as a desk and that is an additional saving. The secretary suggests that you and I play racquet ball at $10 a point with the proceeds going to the Student Loan Fund — not a bad idea!
>
> To save us the cost of stamps and mail you might consider sending a stack of signed checks. On the other hand, if you prefer cash, just bring your money to the state association office at the American Bank Building, St. Paul, Minnesota. If the place is locked stuff your money under the door.
>
> You are one of the noble ones. Thanks.
>
> **John**

Subsequently another note came which deserves reproduction. It is from another more serious but no less loyal member, John Coleman.

> John:
>
> I have a good working arrangement with organizations to which I contribute. They send me 12 envelopes per year (prepaid) and I send them a check each month (1/12 of my contribution). I pay them along with the gas and telephone bill.
>
> **John Coleman, M.D.**

What a great idea from a couple of stalwart MMA members! Any takers?

John Regan, M.D.
Chairman

Cover Photograph

"Musical Cattails"

Dr. Claus A. Pierach, Associate Professor of Medicine at Abbott-Northwestern Hospital, took the cover picture at his lake cabin near Zimmerman, Minnesota. A sleet storm had created the ice on the cattails, and as they swayed in the breeze seemed to ring out an ode to the season.

The picture was taken with a 35 mm camera Leica M3 on Kodachrome negative film.

Dr. Pierach is a native of Germany and came to this country about ten years ago. His work at the Northwestern Hospital within the University Medical Unit involves studies in hypertension and porphyria. He is married and has three children.

Continuing Medical Education

Minneapolis Radiological Society

Winter Meeting February 11, 1 p.m., Sheraton Ritz Hotel, Minneapolis. Fourth Annual K.W. Stenstrom Memorial Lecture. Contact Dennis Campbell, M.D., Fairview Hospital, Minneapolis.

New Mexico Metabolism Symposium
March 9, 10 & 11, 1978—Taos, New Mexico

Third annual meeting on Diabetes and Related Disorders. In addition to in-depth discussion on changing concepts in the field of diabetes, the program will provide opportunity to take advantage of New Mexico's fine powder skiing. Further information: Office of Education, Lovelace-Bataan Medical Center, Albuquerque, New Mexico, (505) 842-7353.

Minnesota Urological Society

Pyelogram Conference, January 20, L'hotel Sofitel, Minneapolis, 6:30 p.m. Contact: Helen Chanak, Secretary, 3625 West 65th St., Suite 120, Minneapolis 55435.



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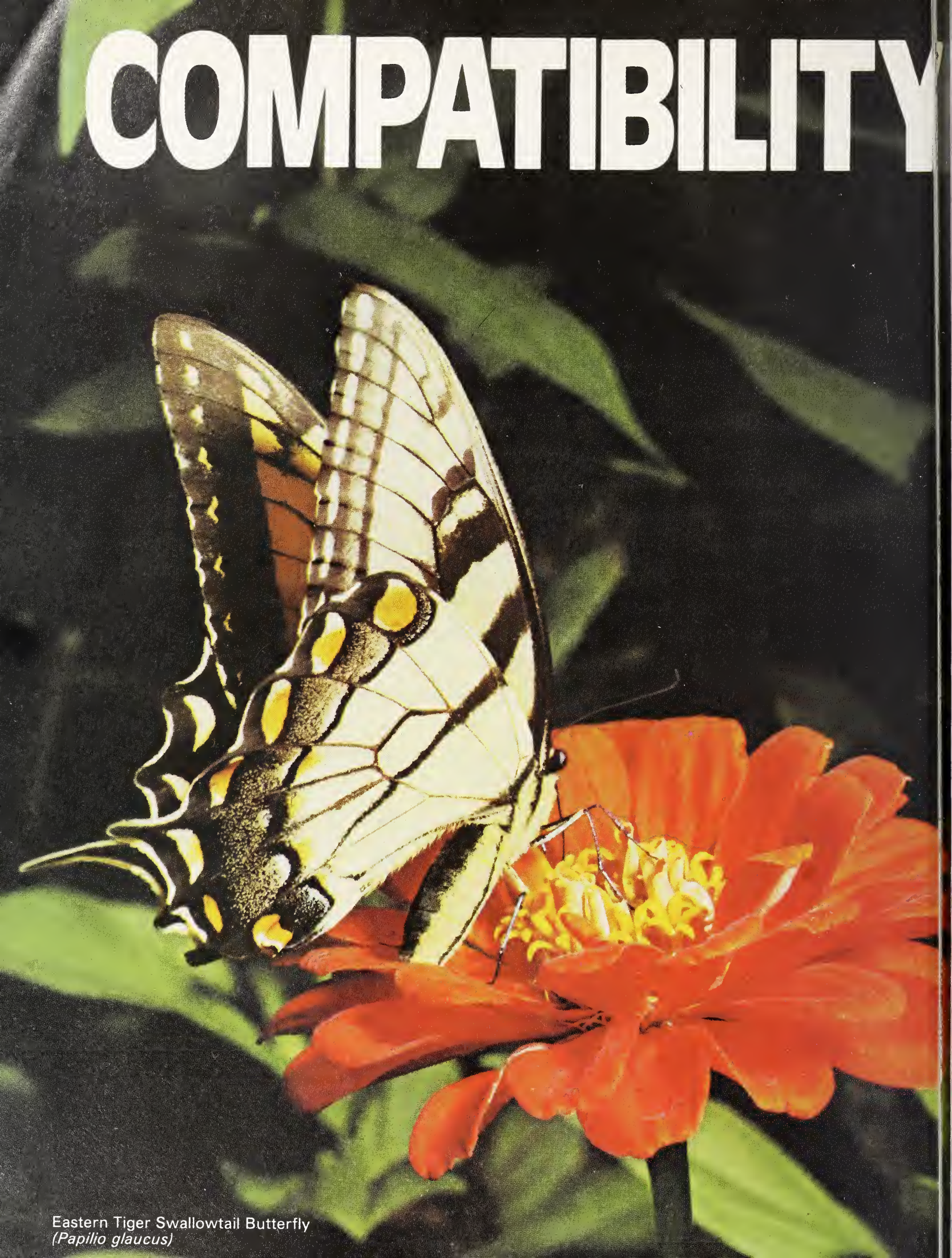
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Dosage and Administration: Oral: 10 to 20 mg., three or four times daily.
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Parenteral administration is not recommended in the presence of hypotension or tachycardia.

Intravenous administration should not be given because of increased likelihood of side effects.

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Although available evidence suggests a temporal association of these reactions with isoxsuprine, a causal relationship can be neither confirmed nor refuted.

Administration of single dose of 10 mg. intramuscularly may result in hypotension and tachycardia. These symptoms are more pronounced in higher doses. For these reasons single intramuscular doses exceeding 10 mg. are not recommended. Repeated administration of 5 to 10 mg. intramuscularly at suitable intervals may be employed.

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Special Article

Vietnamese Refugee Care
Psychiatric Observations

ROGER A MATTSON, M.D.* and DANG DINH KY, M.D.†

Care of the Vietnamese refugee in the United States rapidly became a topic of medical, social, and political importance. The principal author is a psychiatrist who volunteered for general medical duty on Wake Island during July 1975 as a member of the United States Air Force Reserve in the "Operation New Life" program. He cites his observations, including the low incidence of alcoholism, drug abuse, and psychotic disorders. Based on the care of approximately 7,500 refugees, a number of cultural applications are described which should be useful in the future care of Indo-Chinese people, particularly those who have settled in the United States.

THE CLOSE OF THE Bicentennial year emphasizes that most of us, directly or by ancestry, have been refugees or immigrants. Our ancestors were left to care for themselves, or were treated in a medical system in which substantial language and cultural problems existed between patient and physician. This problem has attracted world attention since April, 1975 with the rapid fall of the Nguyen Van Thieu government and the subsequent evacuation of some 140,000 Vietnamese refugees to Wake Island, Guam, refugee camps in California, Arkansas, Florida, Pennsylvania, and to Third World countries.

Wake Island, a tiny atoll of aeronautical and World War II historical fame, became a part of a Congressionally approved program for Vietnamese refugees entitled "Operation New Life" on April 25th. Because of over-crowding at Guam, 8,000 arrived in the first wave, and subsequently a total of 16,000, including 28 newborns, made Wake Island, a U.S. Possession, their temporary home between April 26th and August 2nd. At that time the remaining refugees were transferred to the continental United States by military or civilian airlift, where final processing was to take place for immigration visas, social security numbers, and hopefully, civilian sponsorship.

Wake was unique in that it afforded one an opportunity to observe the total community. The daily average Vietnamese population was approximately 7,000, with about 250 civilian employees, mainly of Philippine citizenship, and about 250 regular and temporary duty military members, under the direction of a USAF Colonel designated as "Task Force Commander." Wake was also unique in that it had no local civilian government or citizenship to apply political pressure.

Geographically, social controls were applied. Wilkes and Peale Islets were declared off limits to refugees. Housing, dining halls, and base exchange facilities were segregated, except for official business. Socialization was freely permitted in public areas, beaches, schools, churches, playgrounds, etc. The refugees had their own dining halls, free supply points for necessities, their own community council, informal schools and classes, church services, and some recreational activities. They were not permitted alcoholic beverages and their only access to drugs or medical care was through the 656th and subsequently the 657th Tactical Hospitals, deployed from Clark AFB, Philippine Islands, to Wake. The American Legion building was used as a clinic and tents were used as wards. Emergency surgery was available, and the daily inpatient census averaged 15 and outpatient visits averaged 200 daily, ranging from 10 to 600 visits per day.

Observations

The following medical, social and descriptive impressions are made based on a July 2nd to August

*Private Practice of Psychiatry, Duluth, Minnesota and Assistant Clinical Professor of Psychiatry, University of Minnesota, Duluth, School of Medicine, Duluth.

†Vietnamese Physician Training Program, University of Arkansas Medical School, Little Rock, Arkansas.

Presented at the 129th Annual Meeting of the American Psychiatric Association, Miami, Florida, May 10-14, 1976.

2nd tour of duty as one of five physicians on Wake. Patient interviews were often through use of an interpreter. Discussions with base and refugee population, newspaper articles, and general observations were the primary source of data.

General Health

The general health of the population was good. Most frequent problems were those associated with population in a tropical area such as upper respiratory infections, gastroenteritis, dermatitis with fungal infections, intestinal parasites (pinworms, ascaris, flukes), and psychosomatic complaints. Less than 1% of the population was air-evacuated medically. This was mainly for definitive surgical treatment, or followup care for tuberculosis or malaria, which should be suspected if spiking fever and chills are present. Several families treated themselves with a Vietnamese form of acupuncture in which linaments were rubbed with a coin which caused dramatic erythematous skin markings.

Population Characteristics

The youngest patient was a female delivered by the author on July 31st; she may become known as "the last baby born on Wake." The oldest noted was age 81. Proportionately, there seemed to be rather large numbers of children. Vietnamese families tend to be large extended units. A mother with five to ten children was not uncommon. The proportion of people over age 60 appeared quite large for a migratory population. Many of these had previously evacuated from North Vietnam in 1954. Three generation extended family units numbering over 25 people, all wanting to remain together, were not uncommon. This presented some problems in housing and "adoption" by American families. Minnesota received 3,802 refugees;[1] 47% were under age 18.[2] Males slightly outnumbered females, 51% to 49%.

Class Structure and Social Characteristics

All those accepted for immigration were of Vietnamese or Cambodian citizenship or part of a Vietnamese family. A few had Chinese background. No Montagnards (mountain people who like the French) were noted. All social classes were represented, although the extremely wealthy or prominent people had generally been rapidly transferred to the United States or third countries. Left were mainly a middle class population of former Vietnamese or U.S. government employees, middle class businessmen, professional people, and students. Most of these came from the Saigon area. There was also a group of fishermen and farmer families, mainly from the Delta area, who apparently had more time to exit and used small boats for transportation until boarding larger naval vessels.

Over 500 of South Vietnam's 2,000 to 2,500 physicians left. Physicians reported it was difficult for this group to leave because of patient care responsibilities and the physician shortage in Vietnam.

Freedom was the main reason given for leaving. Many had plans to join friends or relatives in the United States or countries such as France. Students generally hoped to continue their studies. Some feared punishment. A few left to "follow the crowds," or for adventure. Some had previously worked for United States firms and hoped for reemployment. Catholics and Protestants left in greater percentages than Buddhists or people of other Eastern religions such as Chaodaism. While about 15% of the population of South Vietnam was Christian, about 50% of the refugee population had this preference.

Repatriation

In spite of short notice to leave, and often few belongings and family left behind, no patient asked the author about returning to South Vietnam, even though the possibility was discussed with several, such as parents separated from their children or spouses. A general estimate is that 100 of 16,000 processed through Wake asked to go to Guam to await repatriation. 1,546[3] or about 1% sailed home October 16, 1975 aboard a Vietnamese cargo ship from Guam.

Unique Cultural Problems and Personality Characteristics

The U.S. citizen may believe that "all Orientals are alike," but generally speaking, the Vietnamese do not get along well culturally with other Asians. Basic to this may be resentments over 1000 years of Chinese domination and the effects of years of war. Thus on the surface it would appear that many would be likely employees of Chinese or Japanese restaurants. Refugees of both Chinese and Vietnamese backgrounds asserted that "working for other Oriental nationalities," such as in restaurants, would not be feasible. Naming may also present some problems as husband and wife may each keep their own surname, which is written first and children can be named after either parent.

In general, the children and adults seemed happy. The patients were quite stoic, willing to wait, were polite, and thankful for treatment. Basically, the people seemed clever and energetic as evidenced by the making of kites, hats, luggage, etc. from old material, clothing, or cardboard. They also conducted

school classes and religious services. The Vietnamese assisted in their medical care by working as interpreters or medical assistants. Frequently patients came as a family to the hospital. In Vietnam, the family usually provided the nursing care. Mother and child often slept in the same hospital bed.

Psychiatric Disease and Food Complaints

Many presented complaints of "food allergy" from the modified U.S. diet of beef, pork, chicken, and fish served with rice and canned vegetables. Symptoms included itching, vertigo, headache, bowel symptoms, and inability to sleep. Rarely were objective signs present, except with salt water fish. Use of disposable utensils and dining halls kept true "food poisoning" to a minimum. Constipation, treated symptomatically, was also frequent. Weight reduction was suggested to only one patient, as the patients were less obese than a comparable U.S. population.

In greater perspective it seems the problem is one of a general "food complaint" from the usual Vietnamese diet of mainly fresh vegetables, fruits, rice, fish, and little meat, to one high in protein, fats, and low in fresh fruits, vegetables, and juices. Decreased use of fluids, lack of exercise due to riding a bus rather than walking or using bicycles, and diet changes were also significant factors of gastrointestinal complaints.

Few patients presented with purely emotional complaints and no cases of alcoholism or drug withdrawal symptoms were noted in the population. No instances of toxic withdrawal symptoms of the journey from Vietnam were reported. There was no sale of alcoholic beverages to the Vietnamese and only USAF prescribed drugs were permitted. Perhaps the more severe alcoholics and drug addicts stayed in Southeast Asia.

Psychosomatic complaints such as headaches, stomach pain, or insomnia were frequent. These patients were often asked: "Do you have any worries or tensions?" Most replies mentioned anxiety about missing family members or a future home or job. Treatment was symptomatic and brief ventilative psychotherapy was often included.

Two young women were briefly hospitalized for hysterical and conversion symptoms associated with marital or family problems. Prior to the author's arrival, one patient was evacuated for "mental observation." There was only one death on the island, a drowning of an individual with a history of depression. A toxic febrile psychosis due to malaria was treated.

Neurotic depressions were relatively few. In Vietnam there is no psychiatry specialty, but it is combined with neurology or general medicine. Most psychotic patients would be treated in general hospitals and followed by their family with use of a drug such as chlorpromazine on an outpatient basis.

Separation

If a full range of activities and jobs had been provided, perhaps 50% would have been willing to settle permanently on Wake. In two short months, many refugees began to regard Wake as their home, and leaving was only with mixed emotions. Perhaps "Mongo," a 22-year-old apparently mute boy who was "adopted" as a hospital aide, would never find a better home. The interpreter or school teacher may never have greater status; or the priest may never have a more receptive congregation. On leaving, the deeper emotions of joy, sadness, and thankfulness were expressed by repeated visits to say goodbye; tears of joy and sadness were shed. Hopes for future meetings were expressed and counseling was provided by the Vietnamese, an Air Force Chaplain, and by the community at large.

Medical Transition

During September 17-19, 1975, the Faculty-Council-in-Exile of the Faculty of Medicine, University of Saigon, met in Chicago and awarded medical certificates to forty senior students who had studied for seven years in Vietnam and who were enrolled in one of eight Vietnamese Physician Training Programs. At this time, for example, there are over twenty Vietnamese physicians at the University of Arkansas in such a program designed to improve their skills and to prepare them for licensure. Sadly for many others, however, those below senior standing have had to begin undergraduate studies from the beginning, and due to language and financial difficulties, few will probably become physicians. Some have entered paramedical fields of study. The educating, testing, and licensure of recognized Vietnamese physicians and dentists is continuing, although, because of the larger than expected numbers, funding is a problem.

Conclusion

Working with the Vietnamese refugees can be stimulating educationally, and medically and personally satisfying. These patients will be seen in scattered numbers by physicians through the continent. Tropical and infectious diseases should be kept in mind, but psychosomatic complaints, adjustment reactions, and

reactive depressions may become more frequent. Understanding the cultural background, use of an interpreter, and a friendly "dau?" (pain in Vietnamese) should be helpful to the treating physician.

The modern day immigration of a large foreign population raised the anxiety of the American people. By late December, 1975 all refugee camps were closed and all Vietnamese had some sponsorship plan. To date, most experiences have been more favorable than expected. Some of the refugees, unhappy with their original location in the U.S., worked and have moved closer to family or friends of their choosing. We close this era with more unity and hope as a result of our experiences of people helping people.

Acknowledgements

The principal author wishes to thank the United States Air Force and the USAF Reserve for this opportunity of Service. During the principal author's stay on Wake Island, Dang Dinh Ky, senior medical student, University of Saigon, helped as an interpreter and in medical observations. He has maintained contact with the author. After processing at Fort Chaffee, Arkansas, he entered the Vietnamese Physician Training Program at the University of Arkansas and was awarded his Doctor of Medicine degree by the Faculty-Council-in-Exile, September, 1975.

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Continuing Medical Education

University of Minnesota — Gastrointestinal Surgery

The Department of Surgery of the University of Minnesota Medical School will present "Gastrointestinal Surgery" at its 42nd Annual Continuation Course, June 14-17, 1978, at its West Bank Auditorium, University of Minnesota Campus. The emphasis is on new developments in gastrointestinal surgery and on controversial topics.

For further information contact: Continuing Medical Education, University of Minnesota, Box 293 Mayo Memorial Building, 420 Delaware Street Southeast, Minneapolis, Minnesota 55455.

Hennepin County Medical Center

Doctor John T. Crosson, Associate Pathologist at Hennepin County Medical Center, Minneapolis, will be conducting a Medical Immunology course beginning February 1st. The Medical Immunology course is designed as a basic course whose purpose is to provide clinicians with an understanding of how immunology and immunologic concepts can be used in diagnosis and treatment of patients.

Presentations beginning Wednesday, February 1, are from 12:00 noon to 1:00 pm in either Hennepin County Medical Center's Pillsbury Auditorium, or Lower Level Classrooms, at 701 Park Av, Minneapolis.

Minnesota Medical Association

An Invitation to Minnesota Physicians

1978 Annual Meeting
Minnesota Medical Association
May 10-12, Duluth, Minnesota

For Yourself

CME '78 — Clinical Medicine Explored, a scientific program worth 12 hours of accredited continuing medical education.

You're required to have CME credits to maintain your license, and here's a convenient way to obtain up to 12 credits at one meeting. MMA is an association for all physicians, and CME '78 reflects the varied interests of our component specialties. Your input told us to "make it practical," so we did. You can choose from such topics as: Management of the Hemorrhaging Patient, Recent Advances in Respiratory Disease, The Practitioner's Approach to Neurological Problems, or six separate lectures under the title Recent Advances in Clinical Medicine — A Practical Update for All Physicians. This is only a sample of the total schedule. Remember, this is a Minnesota program, primarily of, by and for Minnesota doctors, and geared toward your needs.

For Your Patients

They're the reason behind those needs you expressed. The latest developments in many fields of medicine will help you return to your practice better informed. And since nearly everyone else there will be from Minnesota, you may learn where to refer those patients who need care you can't provide.

For Your Local Colleagues

Return to them with the latest information on non-scientific topics of concern to MMA members. The House of Delegates will meet, as will several specialty societies. Their business is your business.

For Your Spouse

Sharing a visit to Duluth would be reason enough, but there are also many social activities for the two of you to enjoy while you're there. Tournaments, receptions, luncheons, dinners are all included in the meeting plan. Business meetings and social activities are scheduled by the MMA Auxiliary as well, and their local members will be certain to point out the best things for guests to see and do during their visit.

For Your Family

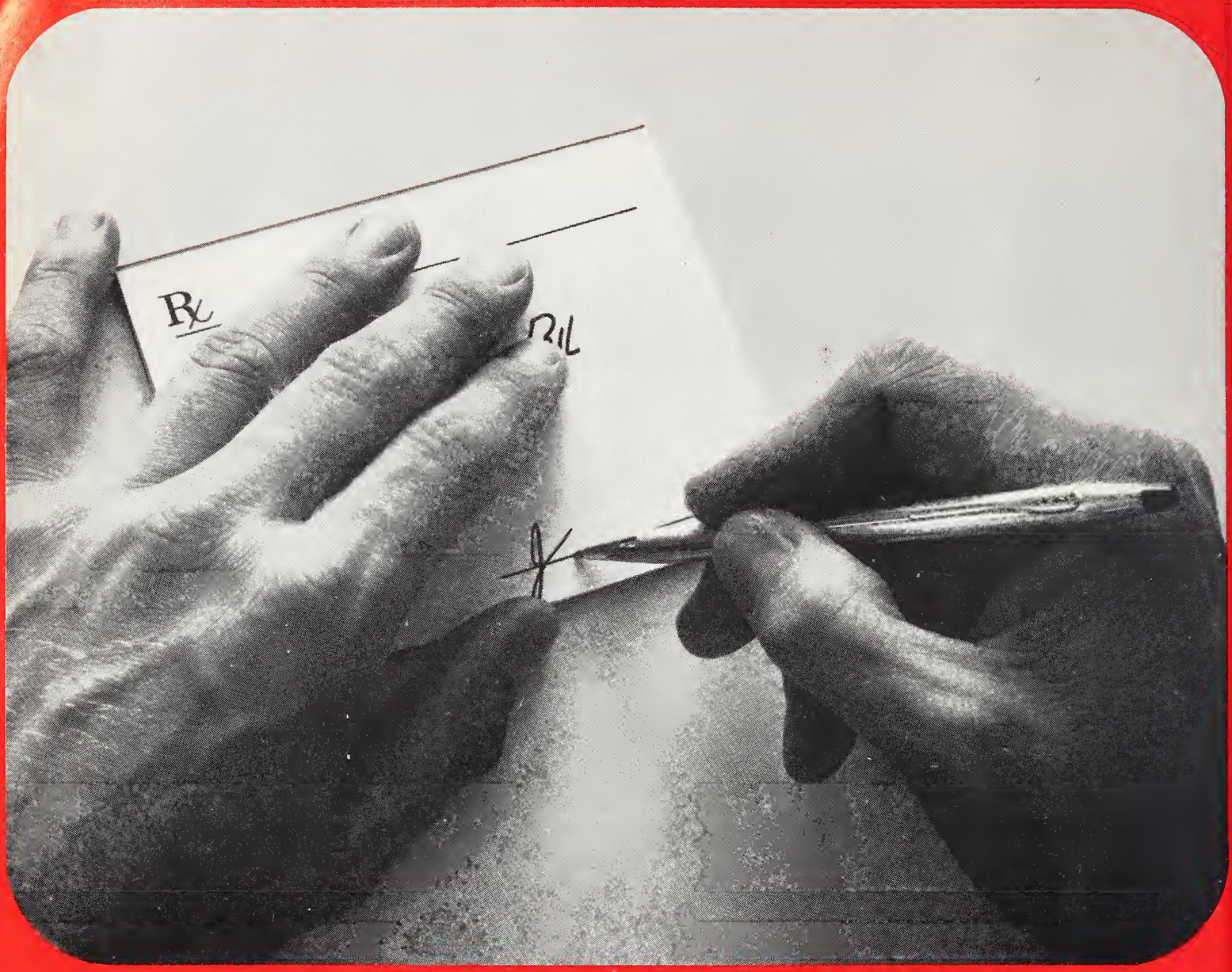
Why not enjoy one of Minnesota's most scenic areas together? Duluth has had a face-lift since we were there in 1974. Several new points of interest will attract your attention. And when the weekend arrives, continue farther north or west for the opening of Minnesota's 1978 fishing season.

Think it over . . . We'd like to see you in Duluth in May.

Registration information in subsequent issues.

S. V. Thorson, M.D.
Chairman
MMA Subcommittee on
Scientific Assembly

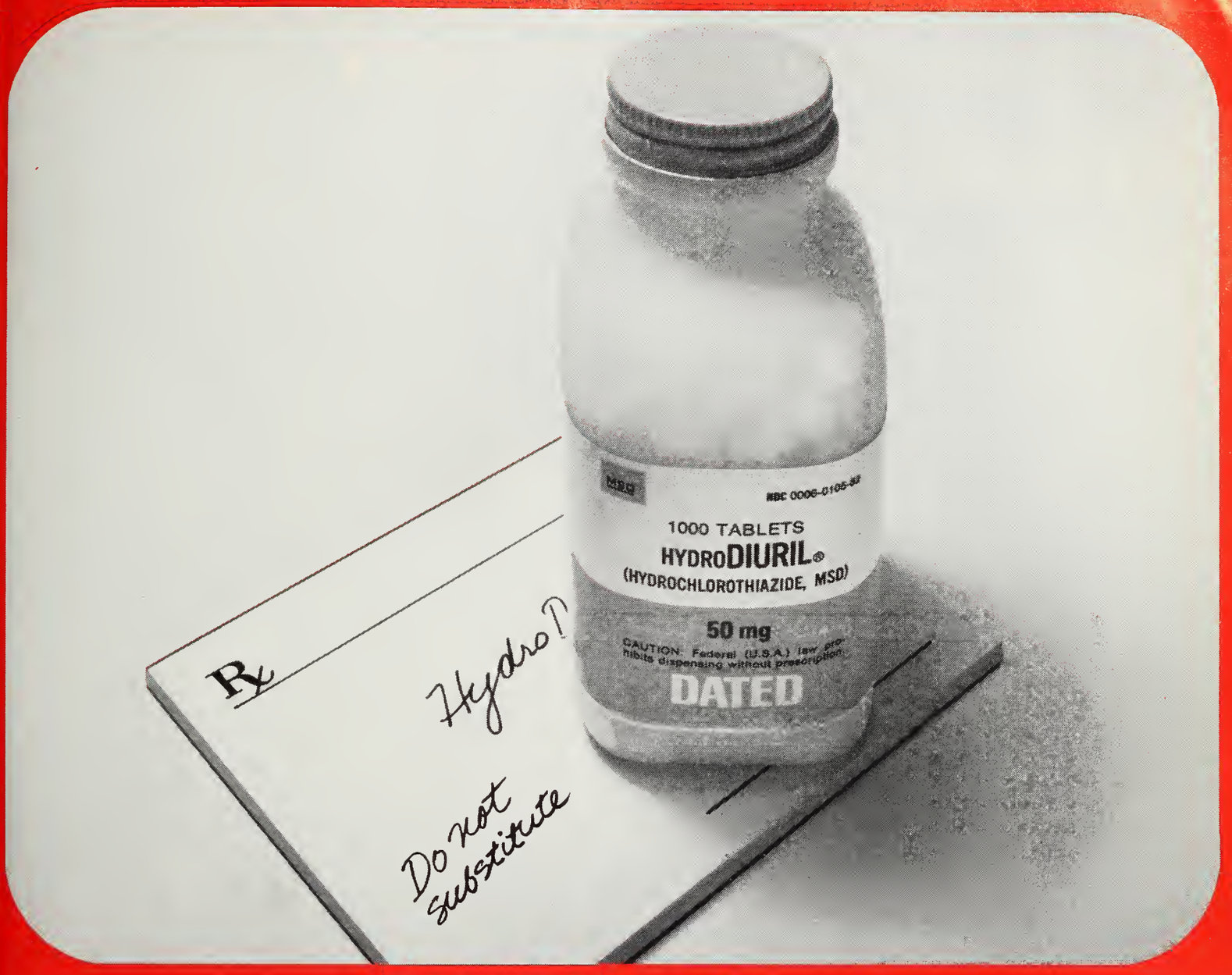
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Contraindications: Anuria; hypersensitivity to this or other sulfonamide-derived drugs.
Warnings: Use with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. Cumulative effects may develop in patients with impaired renal function. Use with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma. May add to or potentiate action of other antihypertensive drugs; potentiation occurs with ganglionic or peripheral adrenergic blocking drugs. Sensitivity reactions may occur in patients with or without a history of allergy or bronchial asthma. Possibility of exacerbation or activation of systemic lupus erythematosus has been reported. Lithium generally should not be given with diuretics because they reduce its renal clearance and add a high risk of lithium toxicity. Read circulars for lithium preparations before use of such concomitant therapy. *Use in Pregnancy:* Thiazides cross placental barrier and appear in cord blood; in pregnancy, weigh anticipated benefit against possible hazards to fetus, including fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions that have occurred in adults. *Nursing Mothers:* Thiazides appear in breast milk; if use of drug is deemed essential, patient should stop nursing.
Precautions: Perform periodic determination of serum electrolytes to detect possible electrolyte imbalance. Observe all patients for clinical signs of fluid or electrolyte imbalance, namely, hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when patient is vomiting excessively or receiving parenteral fluids. Medication such as digitalis may also influence serum electrolytes. Warning signs, irrespective of cause, are dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting. Hypokalemia may develop, especially with brisk diuresis, in severe cirrhosis, with concomitant corticosteroid or ACTH therapy, or with inadequate oral electrolyte intake. Hypokalemia can sensitize or exaggerate response of heart to toxic effects of digitalis (e.g., increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content. Any chloride deficit is generally mild and usually does not require specific treatment except under extraordinary circumstances (as in liver disease or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather; appropriate therapy is water restriction, rather than administration of salt except in rare instances when the hyponatremia is life threatening. In actual salt depletion, appropriate replacement is the therapy of choice.
Hyperuricemia may occur or frank gout may be precipitated in certain patients. Insulin requirements in diabetic patients may be increased, decreased, or unchanged; latent diabetes mellitus may become manifest. Thiazides may increase responsiveness to tubocurarine. Antihypertensive effects of the drug may be enhanced in post-sympathectomy patients. May decrease arterial responsiveness to norepinephrine; this diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use. If progressive renal im-

for experience—



or ours.

pairment becomes evident, consider withholding or discontinuing diuretic therapy. Thiazides may decrease serum PBI levels without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged therapy; thiazides should be discontinued before testing for parathyroid function.

Adverse Reactions: *Gastrointestinal System*—Anorexia; gastric irritation; nausea; vomiting; cramping; diarrhea; constipation; jaundice (intrahepatic cholestatic jaundice); pancreatitis; sialadenitis.
Central Nervous System—Dizziness; vertigo; paresthesias; headache; xanthopsia.
Hematologic—Leukopenia; agranulocytosis; thrombocytopenia; aplastic anemia.
Cardiovascular—Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics).
Hypersensitivity—Purpura; photosensitivity; rash; urticaria; necrotizing angiitis (vasculitis) (cutaneous vasculitis); fever; respiratory distress including pneumonitis; anaphylactic reactions.
Other—Hyperglycemia; glycosuria; hyperuricemia; muscle spasm; weakness; restlessness; transient blurred vision.
Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn.

Note: When used with other antihypertensive drugs, careful observations for changes in blood pressure must be made, especially during initial therapy. Dosage of other antihypertensive agents must be reduced by at least 50 percent as soon as this drug is added to the regimen. As blood pressure falls under the potentiating effect of this agent, further reduction in dosage, or even discontinuation, of other antihypertensive drugs may be necessary.

How Supplied: Tablets containing 25 mg hydrochlorothiazide each in bottles of 100 and 1000 and single-unit packages of 100; Tablets containing 50 mg hydrochlorothiazide each in bottles of 100, 1000, and 5000 and single-unit packages of 100; Tablets containing 100 mg hydrochlorothiazide each in bottles of 100.

For more detailed information, consult your MSD representative or see full prescribing information. Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa. 19486

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The same dosage schedule can be used for both IM and IV administration.

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Most frequently reported adverse reaction is pain on injection. Please see next page for a complete list of reported adverse reactions. **Use with caution in patients with penicillin or other allergies.**

Please see next page for a brief summary of prescribing information, including indications, contraindications, warnings, precautions, and adverse reactions.

†Data on file, SK&F Medical Department. Tissue penetration is regarded as essential to therapeutic efficacy, but specific antibiotic tissue levels have not been directly correlated with specific therapeutic effects.

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ANCEF® IV IM
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Injection: 250 mg, 500 mg, and 1 gram vials

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Most infections can be treated with 500 mg. or 1 gram of 'Ancef' every 8 hours.

Before prescribing, see complete prescribing information in SK&F literature or *PDR*. The following is a brief summary.

Indications: Ancef® (sterile cefazolin sodium, SK&F) is indicated in the treatment of the following serious infections due to susceptible organisms.

Respiratory tract infections due to *Streptococcus (Diplococcus) pneumoniae, Klebsiella* species, *Hemophilus influenzae, Staphylococcus aureus* (penicillin-sensitive and penicillin-resistant), and group A beta-hemolytic streptococci.

Injectable benzathine penicillin is considered to be the drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever.

'Ancef' is effective in the eradication of streptococci from the nasopharynx; however, data establishing the efficacy of 'Ancef' in the subsequent prevention of rheumatic fever are not available at present.

Genitourinary tract infections due to *Escherichia coli, Proteus mirabilis, Klebsiella* species, and some strains of enterobacter and enterococci.

Skin and soft-tissue infections due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci and other strains of streptococci.

Bone and joint infections due to *S. aureus.*

Septicemia due to *Str. pneumoniae, S. aureus* (penicillin-sensitive and penicillin-resistant), *P. mirabilis, E. coli,* and *Klebsiella* species.

Endocarditis due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci.

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to 'Ancef'.

Contraindications: 'Ancef' is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: BEFORE CEFAZOLIN THERAPY IS INSTITUTED, CAREFUL INQUIRY SHOULD BE MADE CONCERNING PREVIOUS HYPERSENSITIVITY REACTIONS TO CEPHALOSPORINS AND PENICILLIN. CEPHALOSPORIN C DERIVATIVES SHOULD BE GIVEN CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS.

SERIOUS ACUTE HYPERSENSITIVITY REACTIONS MAY REQUIRE EPINEPHRINE AND OTHER EMERGENCY MEASURES.

There is some clinical and laboratory evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both drugs.

Antibiotics, including 'Ancef', should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Usage in Pregnancy—Safety of this product for use during pregnancy has not been established.

Usage in Infants—Safety for use in prematures and infants under one month of age has not been established.

Precautions: Prolonged use of 'Ancef' may result in the overgrowth of nonsusceptible organisms. Careful clinical observation of the patient is essential.

When 'Ancef' is administered to adults or children with low urinary output because of impaired renal function, lower daily dosage is required (see dosage instructions in the package literature).

A false-positive reaction for glucose in the urine may occur with Clinitest® tablets; use glucose enzyme-type reagents.

Adverse Reactions: The following reactions have been reported: Drug fever, skin rash, vulvar pruritus, eosinophilia, neutropenia, leukopenia, thrombocythemia, and positive direct and indirect Coombs tests have occurred. Transient rise in SGOT, SGPT, BUN, and alkaline phosphatase levels has been observed without clinical evidence of renal or hepatic impairment. Nausea, anorexia, vomiting, diarrhea, and oral candidiasis (oral thrush) have been reported. Pain at the site of injection after intramuscular administration has occurred, some with induration. Phlebitis at the site of injection has been noted. Other reactions have included genital and anal pruritus, genital moniliasis and vaginitis.

Administration and Dosage: 'Ancef' may be administered intramuscularly or intravenously after reconstitution. See the package literature for reconstitution procedures.

See the package literature for dosage recommendations.

How Supplied: 'Ancef' (sterile cefazolin sodium, SK&F)—supplied in vials equivalent to 250 mg., 500 mg. or 1 gram of cefazolin; in "Piggyback" Vials for intravenous admixture equivalent to 500 mg. or 1 gram of cefazolin; and in Pharmacy Bulk Vials equivalent to 5 grams or 10 grams of cefazolin.

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Interview

Interview with Dr. Robert Kelly

Chairman of the AMA Delegation from Minnesota

Interviewer:

Dr. Kelly, you are Chairman of the AMA Delegation from Minnesota. How long have you served in that capacity?

Dr. Robert Kelly: Nearly two years.

Interviewer:

Would you say the tone of organized medical politics has changed? Is this a different era than when you first entered practice?

Dr. Kelly:

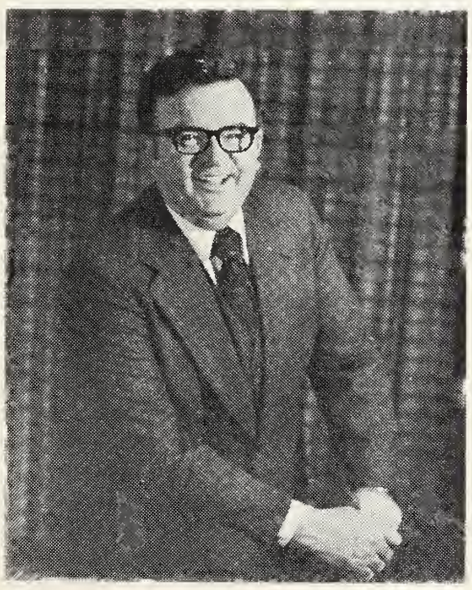
It has changed, and in the last five to six years it has changed dramatically. American physicians are responding more importantly to the needs of the patient.

Interviewer:

What do you mean "more importantly to the needs of the patient?"

Dr. Kelly:

Well, physicians are much more knowledgeable about health care delivery systems. For example, there has been an exceptional effort on the part of the membership of the American Medical Association as well as the House of Delegates and the Board of Trustees to come up with a responsible proposal for national health insurance. Previous to this, organized medicine was not really in the forefront in making a positive proposal for national health insurance. Now we are in that position.



Interviewer:

Would you say that we have shifted gears from passive resistance to active participation?

Dr. Kelly:

Yes. When I was first a delegate to the American Medical Association, about eight years ago, the AMA was criticized for being a conservative organization that was not in tune with society. Now we are being criticized for being too liberal.



Interviewer: *Liberal in what sense?*

Dr. Kelly:

Liberal in that we are proposing a national health insurance program. But, in this national health insurance program, we do feel there are many important concepts which are primarily important for the health care of our patients and for our nation.

Interviewer: *Could you just describe these concepts?*

Dr. Kelly:

For example, we try to keep the administration of this program in the private sector, administered by the private insurance companies. This makes sense not only from the economy standpoint; it also makes sense from an administrative standpoint. We don't feel a government bureaucracy can do a better job than the private sector who is already performing this type of function. This is just one example.

Interviewer:

Dr. Kelly, I've heard the Minnesota Medical Association is losing members, and we may lose our fifth delegate to the AMA. Is there anything to that?

Dr. Kelly:

For about the last three years this has been a problem, and it continues to be a problem. However, I am proud to say the Minnesota Medical Association has been a leader in encouraging and developing activities in the intern-resident section, in the medical student section, and in encouraging membership in these sections.

We have had an overwhelming response, and it is improving every year with more interns and residents and younger members coming into our organization. Because of this recruitment drive and because of the improved ability of our Board of Trustees of the Medical Association and our Delegates to the American Medical Association, the Membership of the Minnesota Medical Association approves of what is being done. Consequently we have noticed an increase in our membership payments, both on a state and AMA level.

Interviewer:

I understand there is a resolution before the House to give full membership to medical students and residents. I suppose that would serve two purposes: to get the younger people more fully involved and also to bolster the membership. Any thoughts?

Dr. Kelly:

I'm in favor of this resolution. I feel no threat to having interns, residents, and medical students in our organization. The sooner we can get medical students interested in what we're trying to accomplish and what we're trying to achieve, the sooner these young people will be able to assume a responsible role in our medical society.

Interviewer:

That leads me to my next question. Dr. Kelly, you are from a ten-man clinic in rural Minnesota, namely Grand Rapids, a town of about 7,600. In that position you have engaged in the process of educating young medical students about rural practice. Could you comment on your experiences?

Dr. Kelly:

Well, first of all, I enjoy having the opportunity to participate in education programs as far as our medical schools are concerned. And, I suppose I could look at it from a selfish standpoint, because I really feel that I have gained as much from a medical education standpoint in having the privilege of teaching these medical students as the students have received from associating with me. It's important for physicians in small communities to take an active role in medical education, be it on an undergraduate or graduate level. Private physicians have a great deal to offer in supplementing the excellent education that our students are receiving at our three medical schools. But, I think we can offer them something medical schools in their own environment are unable to offer. Also, as private physicians in communities and also as hospitals in our communities, we have a definite obligation to provide this opportunity to educate our medical students.

Interviewer:

You say you offer medical students a new dimension. Could you clarify that a little bit?

Dr. Kelly:

For example, I have had three students in the last four years in the rural physician associate program. This is a program in which the student spends a year of his education on a one-to-one basis with a preceptor in this program. This has been an excellent program for the student because he is allowed to get out into practicing situations where he is able to see the patients as they come in off the street. He is able to have first exposure to this patient, and depending upon the time that he has spent with this preceptor, he is given more and more responsibility regarding his interaction with that patient. He is allowed to determine for the first time on a one-to-one basis with that patient the needs of that patient, what the problem is, and is able to make a diagnosis. He is able to use the facilities of the rural hospital or office to make this diagnosis. In effect, we are able to project this man into a practice situation, which I think is important.



Interviewer:

What year of medical school does the student come to you?

Dr. Kelly:

He comes to us in the phase D program. This would mean in his junior year in medical school. These young men have a thorough background in basic sciences. Then they come out to us, and over the period of a year we see these young men virtually explode in their knowledge of clinical skills and in developing technical skills. This is all gratifying to see.

Interviewer:

Do you sense an excitement as their clinical skills explode? Are the students enthusiastic about this?

Dr. Kelly:

I am excited about it, and the students are excited about it too. Students really don't appreciate their experience as much during the time they are receiving the experience as after they get back to the medical school and then realize the number of things that they have learned. They spend their last year of clinical training at the University.



Interviewer:

It sounds to me like the practice experience gives them an important perspective in what medical practice is all about.

Dr. Kelly:

It does a number of things. It gives the student an idea as to whether or not he feels he can practice medicine comfortably and use his talents and training in a rural setting. It also tells him if he wants to continue the practice of medicine as a family practitioner or a primary care specialist. Even more important, it gives him the opportunity to decide whether or not he wants to practice in the primary specialties.

Interviewer:

Is there any concrete evidence that this rural physician program has helped ease the maldistribution problem?

Dr. Kelly:

There is some evidence coming out now that a large number of these young men are practicing in similar environments in which they took their training. I am privileged to have my first rural physician associate now as my partner in the Itasca Clinic. He has been with our group for 2½ years since he finished his training. The last student I had was interested in returning to Grand Rapids to continue his practice with our clinic after he has finished his family practice training. This is being seen throughout Minnesota, but I don't have concrete statistics for you.

Interviewer:

To switch the subject a bit, I heard criticism that AMA delegates do not represent a cross section of their constituency. How do you keep in touch with the grass roots members?

Dr. Kelly:

It's not hard for me to keep in touch with the grass roots members because I am one of them. Minnesota especially has a well representative group in our delegation. We have two members from rural areas and three members from urban areas. We have a member from the Ramsey County area, one from the Hennepin County area and one from the Rochester area. So we have little difficulty in communicating with the grass roots. The only thing I would encourage is for more physicians to contact us to let us know what the problems they want us to bring before the American Medical Association. Another thing is that we would be happy to be invited to local medical societies, not only to make a presentation but to answer any questions they may have.

Interviewer:

Then, we'll consider this interview a printed invitation to the members to invite the AMA delegates to speak before their gatherings.

Because of your position, you're deep into social and economic issues that face the country in general, medicine in particular. Maybe we can approach some of these now. The number one issue on the immediate national agenda is President Carter's proposal to put a 9% limit on annual rise in revenues of acute care hospitals and also limit capital outlays above $100,000.00. What do you think about this plan?



Dr. Kelly:

I can understand the President's concern about health care costs and particularly hospital costs. This is a very real concern for everyone in the country. Industry and labor have been discussing this problem in detail for the last several years. It would be tragic, however, if this cap on hospital costs would interfere with the tremendous accomplishments that medicine has achieved in its research and clinical development over the last decade. If this cap encourages hospitals to be more efficient, I think this is fine. If it has a tendency to discourage further research and further developments of medical expertise in hospital facilities, then I think this would be tragic for the American people.

Interviewer:

Some of the critics have said that President Carter is attacking this the wrong way. The problem is not in controlling expense, but in dampening the demand for services. And since these services occur because 92% of all hospital bills are paid by third parties, neither the patient nor the physician has any incentive to control inflation. Do you foresee that

maybe we will meet the demand problem by having the patient more aware of his bills, perhaps even having him pay part of his bills?

Dr. Kelly:

First of all I have to say that health care costs in themselves are not just a hospital problem, not just a doctor problem, and not just a public problem. This is a responsibility that has to be attacked or has to be dealt with on a cooperative basis with the hospitals working their best to keep costs down, and with the physicians doing their best to control costs but not sacrificing quality of medical care. Then the public sector also has a responsibility to use medical services in a responsible manner. They must take care of themselves in a responsible manner, because approximately 40% of the illnesses that we're treating today would not be necessary to treat if the public took care of themselves. I'm talking about diet, smoking, alcohol, accidents, and things of this nature.

Just to give you one example, that is near and dear to my heart right now, is this legislation that was passed in Minnesota recently which does not require helmets on motorcycle drivers. This disturbs me greatly, because in our own hospital in the last month, two months since this has happened, we have had to treat two young people who died because of severe head injuries who may not have died had they worn helmets.

I realize the debate of personal freedoms and so forth that went on in passage of this bill. But I'm talking about one segment of personal responsibility that the public must have in an effort to help us control health costs. We can do utilization review in hospitals. We can do utilization review of physicians as they treat patients, but somewhere along the line, we have to encourage and plead with the public to do a little bit of their own utilization review, so that the public demands do not continue to escalate.

I like to call this a partnership in controlling health care costs.

Interviewer:

There is hope. As you know, the death rate from coronary artery disease has dropped about 20 percent the last 20 years. This drop is partly because of mass public education and sensitization to the coronary risk factors. Would you agree that somehow physicians should help educate the public to minimize diseases secondary to the excesses of living?



Dr. Kelly:

I feel that public education is an important part in controlling health care cost. We may be able to improve the quality of health care to this more informed public. Basically this is the endline result of what we are all attempting to do.

Interviewer:

I noticed, for example, the National Association of Internists has decided to go public on such issues, and I'm sure you agree that's a healthy sign?

Dr. Kelly:

Yes. Right now, interestingly enough, over 70% of the American Medical Association's budget is spent in public health education.

Interviewer:

Specifically how does the AMA spend that? What are some of the programs?

Dr. Kelly:

At the present time, the American Medical Association is the largest single publisher of medical publications throughout the United States. They have many brochures; they have many tape and cassette programs which people can rent or can request from the American Medical Association regarding health issues. The AMA has programs for any group of individuals who desire such information. We as physicians could spend a little more time talking to public groups such as Lions Clubs, Kiwanis Clubs and other groups of this nature. This is a responsibility that we as physicians should take more seriously. We should tell the public what we are doing, what we think are good things to do. The public is not adverse to improving the quality of their medical care and keeping health care costs down — sometimes they just aren't knowledgeable with methods in which they can accomplish this goal.



Interviewer:

Physicians, in short, should become more active in the social arena!

Dr. Kelly:

Yes. Now I realize there are only 24 hours in the day, and consequently this is difficult at times. On the other hand, we physicians should become more interested in social issues. Health care costs do involve social issues.

Interviewer:

Yes, I agree. Short of national health insurance, the government's strategy to control quality cost seems to be centered in two main policies, those of PSROs and the HSAs. Could you tell us first about PSROs and how they're coming, and how many of the proposed PSROs have been formed?

Dr. Kelly:

I've been intimately involved in the PSRO movement, because I have been appointed chairman of the Ad Hoc Committee of the American Medical Association regarding PSRO, and I've also been appointed to the National Advisory Council for PSRO. This Council advises the Secretary of Health, Education & Welfare regarding the program's function.



PSRO, as you know, stands for Professional Standards Review Organization. There are 203 organizations throughout the United States. These organizations are indeed run by physicians. These are physician organizations which are financed by HEW and have as their prime responsibility monitoring the quality of medical care which is being performed throughout the United States.

It is hoped that in the process of monitoring the quality of medical care we will improve this quality and produce some cost effectiveness. With this cost effectiveness, it is also hoped that the final result of the activity of the Professional Standards Review Organization will be to upgrade and document the quality of medical care being provided throughout the United States. Maybe we can at least assure the public that they are getting a dollar's worth of quality medical care for a dollar spent. But we can't ensure this is going to be a cost saving mechanism. If it is, that would be a fringe benefit for Professional Standards Review Organizations.

Interviewer:

But there are problems in PSRO implementation. A recent critical article indicates that the physicians have not been playing a major role in organizing and operating these organizations. Physicians tend to delegate responsibilities to non-physician assistants or associate directors, such as nurses, hospital administrators, medical records librarians and so forth. Are these critics correct?

Dr. Kelly:

Professional Standards Review Organizations do not stand by themselves. This is a partnership arrangement. Health care personnel other than physicians are involved in health care review. Something like 89 ancillary health organizations are involved in this PSRO movement. Granted, nurse coordinators review charts, so physicians do not have to review every chart. But, because of standards set up by this committee, the nurse coordinator can pull out charts on which there may be a question. The committees, which are composed of doctors, are making policy decisions regarding length of stay, quality of medical care, and standards of medical care. In the final analysis, it is physicians reviewing physicians. We do request and obviously need the cooperation and help of all the ancillary personnel, depending on what particular facet of medical care is being reviewed. We need nursing help, for example, when we are reviewing nursing care. We need physical therapists to help us when we're reviewing physical therapy. We need dieticians when we are reviewing, for example, diabetic diets and things of this nature.

Interviewer:

Critics say that nationally only 18 of 120 PSROs have MD directors.

Dr. Kelly:

I'm not familiar right now with how many MD directors we have. I

can say this, at the present time, there are only six areas out of 203 in the United States that do not either have a planning or conditional PSRO, or are in the process of contracting for a planning PSRO. I think this speaks well for a program that has only really been in operation for approximately three years. You must remember that some of this delay in developing PSRO has not been doctor caused; it has been caused by lack of financing. There were many areas in the United States that wished to contract for planning PSROs, but there was no money in the budget of the Bureau of Quality Assurance to allow this. So, the physicians can't take all the blame for the sluggishness in developing the Professional Standards Review Organizations.

Interviewer: *So, it's partly just a question of bureaucratic inertia?*

Dr. Kelly: That's a fair statement.

Interviewer:

What about HSAs? They sound logical. After all you split the country into over 200 health service areas, thus decentralizing the bureaucracy. Then you put consumers in control of their own health care costs, and you make the institutions coordinate all health care activities. This all sounds reasonable. But, the main effect so far seems to embroil HSA members in controversies with hospitals and doctors.

Dr. Kelly:

The Health Service Administration Program is the law of the land. We must deal with the law of the land.

I think that planning is important. How planning is done, I think is extremely important. I don't think that the individual rights of our citizens should be encumbered by excessive bureaucratic planning. However, organized planning is extremely important if we're going to continue to improve our health care delivery system. As far as HSAs are concerned, this is basically a planning bill. I think the intent of Congress was to make it a planning bill. However, some interpretations of the HSA bill lead me to be a little bit anxious and apprehensive. When they start talking about determining quality of medical care and the utilization of medical care by people who are untrained in evaluating it, it makes me nervous. I would anticipate and expect Professional Standards Review Organizations to be doing their utilization review and quality assessment programs. Then HSAs would pretty much be limited to planning appropriate availability of facilities for health care.



Interviewer:

I gather you think it's too early to be unduly critical of either PSRO or HSA, that we should give them both time to ripen and mature?

Dr. Kelly:

The jury is still out, because we don't have enough data on the capabilities of these organizations. Until we have the data and results of the capabilities of these organizations, it's impossible to evaluate their total impact on our society.

Interviewer:

Let me speak for the physician for a moment. Do people who launch such programs ever stop to think of the physician time consumed in participating in these processes?

In my experience, the fundamental complaint of physicians is that they don't have enough time to devote to lengthy unproductive committee meetings. Do you think these doctors are being petty, or is this a real problem?

Dr. Kelly:

It's a matter of priorities. I personally am taking an inordinate amount of my time in dealing with the issues we've talked about today. I would hope that other doctors would not use lack of time as an excuse not to participate in improving the plight of our patients. I would hope that physicians would recognize they need to provide leadership in this type of endeavor, that they would find a little more time to spend in being involved. I think a little time spent by the physician in providing expertise and input into these committee meetings and deliberations with planning organizations is important. We must endeavor to improve all health care for our patients. Basically, this is why we all went to medical school. To improve the health care of our patients should be the primary goal of all physicians.



Interviewer:

Many of these programs seem to be compelling us to be social leaders.

Dr. Kelly:

Dealing with these programs makes physicians acutely aware of the health needs of not only their patients, but of the people of Minnesota and the people of the entire United States. We are living in an era in which we can't be too parochial in just our own little communities. We have to look at this over a broad spectrum of activities. This is where I think the physician has an obligation to provide his input.

Interviewer:

Do you think physicians are becoming more sensitive to the economic pressures on patients?

Dr. Kelly:

I would hope so. You know in family practice we are dealing with the economics of our patients all the time. Maybe we're a little bit closer to the stresses and strains of the pocketbook as far as our patients are concerned. But, I would hope this would be a responsibility for all physicians, no matter what his specialty or training might be.

Interviewer:

How do you feel about HMOs?

Dr. Kelly:

I have been very intimately involved with the HMO concept, in other words, total health care for people at a pre-payment mechanism ever since I have been in practice. I am acutely aware of this type of health care delivery system. First of all, I think the health care delivered in the HMO setting is excellent care. I have no quarrel with the concept of total coverage, pre-paid insurance for which basically the HMO concept is being developed. However, I do object to the closed paneled type of HMO as opposed to the independent physician association. I still feel that the free choice of physician on the part of the patient is extremely important, and I also think that the free choice of referral specialist on the part of the physician is an important concept for my patient. Consequently, in the closed panel program, if you have to refer a patient outside your given clinic, then you must pay for that patient's medical care. This is a wedge between myself and my patient. If I feel that a referral is not medically necessary, the patient may feel that I am making this decision on a fiscal basis rather than a medical basis. To me, this interferes with the doctor-patient relationship which I hold sacred. But I have no objection to the concept of total pre-paid plans if this is what the patient desires. I feel that it is important to have a health maintenance organization that allows the patient to have free choice of doctor or clinic. We have been doing this in Itasca County in different ways for the last 15 years. These plans have been accepted by our patients and have been very well received.



Interviewer:

One thing that the proponents of HMOs don't talk about is their marginal economic performance. For example, the government has sponsored HMOs in health scarcity areas and they call this their family health center programs. They've launched 30 of these since 1975, and only 20% are economically viable. What I'm getting at is this: so far many HMOs have not been able to survive without government props. Do you have any experience with the financial track records of HMOs?

Dr. Kelly:

I personally have never been involved in an HMO type health care delivery system that has been sponsored or supplemented by government income. I feel quite strongly that if an HMO cannot stand on its own two feet, then we either have to question the benefits that an HMO offers, the administration of the HMO, or the premium structure in which the HMO is charging in the first place. I think it is extremely important for government subsidized HMOs to realize this, and I frankly am opposed to government subsidies of HMO movements. It is increasingly evident that front end deductibles may be necessary to control escalation of costs in total coverage type plans.

Interviewer: Dr. Richard L. Reece
Photographer: Dr. Farrell Stiegler

CME-Minnesota 1977-1978

In 1973 the House of Delegates of the Minnesota Medical Association directed the MMA Council to require documentation of continuing medical education (CME) credit as a partial requirement for membership in the MMA. The first MMA three-year cycle, utilizing a modified Oregon plan and administered by the MMA Committee on Medical Education and the Staff of MMA, began in 1974. Each physician was responsible for keeping a record of his CME credits (geared either to general or to specialty practice) and was to report the credit total to the MMA at or prior to the end of the three-year period. The three-year requirement could also be fulfilled by procuring the AMA Physician's Recognition Award, by recertification by the Academy of Family Physicians, or by completion of other equivalent programs of a specialty.

Despite this voluntary program, the 1976 Minnesota State Legislature passed a law that would allow the Minnesota State Board of Medical Examiners to *require* each physician in the state to demonstrate evidence of CME in order to maintain medical licensure in Minnesota.[1] With the passage of this law and the ongoing plans of the Board to create a CME-reporting rule during 1977, MMA declared a moratorium of "at least one year" for beginning its second three-year CME-reporting cycle (1977-1979). This decision was made to prevent duplication of effort, dual reporting, and a sense of "double jeopardy" for members. Therefore, the *new* MMA requirement of 150 hours of CME planned for the 1977-1979 triennium, linked to membership in the MMA, was suspended. The report for the first (1974-1976) period (the MMA program) was still required during 1977.

Presently (November 1977), the Minnesota State Board of Medical Examiners has promulgated rules requiring evidence of 150 hours of CME each three years as a partial requirement for valid licensure to practice medicine in the State of Minnesota. It is anticipated that the Board's program will commence on January 1, 1978. Although reflecting in their totality the thoughts and plans of Minnesotans, the MSBME rules resemble the AMA's Physician's Recognition Award in the creation of distinct categories of educational endeavors (Table 1).

The legislative process in the State of Minnesota is designed to prevent implementation of rules without notice to the public and the parties affected (Table 2). Thus, a public hearing of the rules proposed by the MSBME was held on October 4, 1977, after due notification.[2] Each Minnesota specialty society and each county medical society was notified in advance by MMA to enable all who might wish to testify to appear at the hearing.

The testimony of the Minnesota Medical Association was: "MSMA supports the Proposed Rules of the State of Minnesota Board of Medical Examiners relating to Continuing Medical Education even though there is no clear evidence that CME assures physician competence. Possessing considerable experience from its earlier program of CME as a partial requirement for Association membership, MSMA would offer appropriate advice and/or assistance to the Board to facilitate implementation of the proposed rules. With this support, it is the hope of MSMA that all CME rules will continue to reflect, in both public and private sectors, interest in and responsibility for educational excellence with economy, the better to serve Minnesota's patients."

TABLE 1

Requirements for CME by Minnesota State Board of Medical Examiners
(Proposed Rules)

Category I
Educational activities approved by Board

Category II
Educational activities not meeting Category I standards

Category III
Medical teaching

Category IV
Papers, publications, books, lectures, exhibits

Category V
Professional reading, preparation for specialty recertification, peer review, self-assessment

TABLE 2

Rule Procedures, Abridged, of State of Minnesota
(15.0411 to 15.052)

Notices of public hearing
Public hearing
Report of hearing examiner
Agency adoption report
Attorney General review
Attorney General approval
Publication in State Register

CME Objectives

There is no clear evidence that CME assures physician competence. Yet there is no physician among us who cannot recall a personal experience in which new information, or a new depth of old information, has not only changed his or her practice, but has altered an entire concept of a disease or of patient care. Each physician must know of many of the rapidly developing changes in medicine, but each physician also needs to know when, how, or how much to apply them or, more critically, when *not* to apply them.

Some of us may recollect that dynamic educational process by mention of a few examples. What were your thoughts in the 1940's when you heard a machinery-like murmur in the second left interspace? What process does that finding commence today? Apply the same thinking to cervical cytology, herpes, Swann-Ganz catheter, nitroprusside, vagus nerve anatomy, Crohn's disease, "chenocholic acid"' cimetidine, staging procedure, thyrotoxicosis, adjuvant therapy, cow's milk for babies (or for adults).

Knowledge, both generalized and specialized, is vital to a modern physician's practice. However, we know that information may not be accurately retained if it cannot be quickly applied. Input of knowledge cannot by itself suffice. Knowledge should be sought to satisfy an identified need, to achieve a personal or professional goal or the setting of an objective, or to gain a broadened concept or perception. The information is, of course, important, but knowing the ways of easy access to this information may be even more important.

The concepts of the benefits of CME are shared by many persons and organizations. Thus, from the pioneering of the Academy of Family Physicians to recertify members, there has developed a veritable maze of groups requesting a variety of demonstrations that the physician possesses current medical information—American Medical Association, American Osteopathic Association, specialty societies, specialty boards, state medical associations, state licensing boards.

The good intentions notwithstanding, "Confusion now hath made his masterpiece" — Shakespeare

Accreditation of Institutions and Organizations

"Only an organization accredited for CME may certify that a CME activity it is sponsoring or co-sponsoring meets the criteria for Category I" (for the Physician's Recognition Award).

Most groups requiring CME for licensure or membership require that a portion of that education be of a formal or structured nature. So that physicians may participate relatively near their practices in learning that follows sound medical education concepts, a process of accreditation of hospitals and institutions that regularly offer such programs was developed by the Council on Medical Education of the American Medical Association. The Liaison Committee on Continuing Medical Education (LCCME) assumed that accreditation function on July 1, 1977.

LCCME-accredited organizations, such as the University of Minnesota, the Mayo Clinic, and MMA, as well as accredited national groups, may plan, sponsor, or co-sponsor, with others, CME programs that meet the criteria for Category I credit. A complete listing of the accredited organizations is available to physicians in the AMA Physician's Recognition Award booklet and the annual CME issue of JAMA.[3] The variety and locations of educational programs emanating from these organizations make physician CME participation more convenient than may initially be thought.

The review process for accreditation of smaller state institutions and groups has been delegated to certain state medical societies, which may review and *recommend* accreditation to the LCCME. The MMA Medical Education Committee, with its Subcommittee on Accreditation, has been authorized to recommend to LCCME institutions and groups throughout the state which are believed capable of sponsoring CME programs for their members. To date, only hospitals with an identifiable financial commitment to a CME program and with directors of CME have been considered by MMA for such accreditation.

Minnesota institutions that have been reviewed by the Subcommittee on Accreditation are listed on Table 3. These institutions and groups, as subsequently accredited by the national LCCME to offer CME

TABLE 3

Minnesota Institutions Reviewed and Recommended by Minnesota Medical Association for Accreditation

North Memorial Hospital, Minneapolis
St. John's Hospital, St. Paul
Hibbing General Hospital, Hibbing
Abbott Hospital, Minneapolis
St. Cloud Hospital, St. Cloud
St. Luke's Hospital, Duluth
Rice Memorial Hospital, Willmar
Children's Health Center & Hospital, Minneapolis
Methodist Hospital, Minneapolis
Metropolitan Medical Center, Minneapolis
Mount Sinai Hospital, Minneapolis
Northwestern Hospital, Minneapolis

courses, may certify that a CME activity it is sponsoring or co-sponsoring meets the criteria for Category I.

Smaller hospitals and groups interested in establishing CME programs may also be reviewed for possible accreditation, and their inquiries are encouraged. MMA intends to work as quickly as possible to review additional organizations to create a statewide grid of hospitals accredited for CME. A physician may receive Category I credit for attending certified courses in any accredited institution, whether or not he is an attending staff member of that institution.

Information on accreditation of individual institutions or groups in Minnesota may be obtained from the Subcommittee on Accreditation, Minnesota Medical Association, Suite 900, 101 East Fifth Street, St. Paul, MN 55101.

Advice to Minnesota Physicians

At this time some physicians seem not to comprehend the requirements for tabulation and reporting of CME activities which soon will affect every licensed physician. This is not unexpected in view of the onset of the many programs, the rapid changes in state and national CME, and the increasing strictness of accreditation requirements to which they have been exposed in the last few years. The following recommendations may assist them and simplify the procedure, which may, in the main, be assigned to the physician's secretary:

IT IS RECOMMENDED that each physician establish a personal ongoing and permanent method of record-keeping of the amounts and categories of his monthly CME activities. Information to be recorded should include dates and hours of attendance, location of meeting, sponsoring organization, broad title designation, and category of activity.

IT IS RECOMMENDED that a suitably prepared CME report be submitted to the national professional organization of the physician's practice specialty (if that field has a CME requirement) *or* that the physician apply for the AMA Physician's Recognition Award (PRA) each 3 years. In some cases the specialty and PRA requirements are reciprocal, but details must be procured from the specialty society or the AMA Department of Physician Credentials and Qualifications.

IT IS RECOMMENDED that each physician be aware that the Minnesota State Board of Medical Examiners has the right to ask for a detailed tabulation of CME activities on a form prepared by the Board. However, the Board *may* accept a copy of the specialty society or PRA tabulation in lieu of a separate list. Physicians should note the close similarity of the Board's categories to those of the AMA-PRA.

Comment

The majority of Minnesota physicians by habit are already engaged in active personal programs of professional education. The big problem is the need to report these efforts in suitable form to the appropriate authority. To many of us this experience is new, frustrating, and bothersome. The MMA staff and members of the MMA Committee on Medical Education are anxious to assist you or to answer your questions. A monthly presentation to answer general and specific CME questions of Minnesota physicians is planned in MINNESOTA MEDICINE. In addition, you are invited to write or call the MMA Department of Continuing Medical Education.

J.S. Welch, M.D.
Chairman, MMA Committee on Medical Education
James Ausman, M.D.
Chairman, MMA Subcommittee on Accreditation

References

1. Minnesota Statute 8:214.12 (1976).
2. State Register, Monday, August 29, 1977, p. 309.
3. JAMA 236:6 pp. 631-802, Aug. 9, 1976.

MSMA Annual Meeting

MSMA Annual Meeting Scientific Program, May 11-12, 1978, Duluth, Minnesota: Hour-for-hour and dollar-for-dollar, it's one of the best CME bargains to be found. If you're looking for some good, practical continuing education, plan to attend.

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CARDIOLOGY, NEUROLOGY AND GENERAL INTERNAL MEDICINE specialty positions available with Mankato Clinic, Ltd. This multi-specialty group attracts specialty referrals from a Southern Minnesota area of 250,000 population. Excellent group practice opportunity in medium sized community with full hospital services; full range of group fringe benefits; liberal time off; salary first year, incentive pay thereafter. For more information call collect Dr. C. H. Brady or Dr. Byron McGregor, 507-625-1811.

FAMILY PHYSICAN Wanted in Southern Minnesota Group Practice. The Albert Lea Clinic P. A., in Albert Lea, Minnesota, a 16 man multispecialty group oriented to primary care with presently 7 Family Practice physicians is seeking a replacement for a senior man. Full time General Practice. Obstetrics. Low cost buy in arrangement. Profit Sharing Plan. Top insurance plan. New hospital in city. A choice practice and an exceptional place to live. Contact B. J. Boss, Administrator, Albert Lea Clinic P.A., 1602 Fountain St., Albert Lea, Mn 56007. Phone 507 373 8251. Personal Phone 507 377 1406. Or contact T. P. Myers, M.D., Chairman, 507 373 8251. Personal Phone 507 373 1294.

OBSTETRICIAN-GYNECOLOGIST with special interest in gynecological surgery wanted to join established multi-specialty group in Northern Minnesota. Growing community, excellent hospital facilities, year round recreation area. Contact C. J. Johnson, M.D. or Brad Smith, Administrator; Grand Rapids Clinic, P.A., Grand Rapids, Minnesota 55744. 1-218-326-9482.

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BOARD ELIGIBLE or certified family physician to join 7-man multiple specialty primary care clinic. New clinic is situated next to 110 bed hospital in community with unique medical climate. Rural setting on large lake with easy access to metropolitan area. Contact Dr. Jon Wempner or Roger Eckstrand, Administrator, Lakeview Clinic, Waconia, Minnesota 55387 Phone: 612-442-4461.

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(Continued to page 58)

(Continued from page 57)

YOUNG FAMILY PRACTICE Clinic, two 33 year old FP's seeking 3rd and 4th partners. Located 20 miles from East St. Paul in St. Croix Valley. Expanding community with stable 50 bed hospital. New Clinic with clinic policy being strictly Family Practice oriented. Call T. G. Domino, M.D. or S. A. Lindahl, M.D. at 1-715-386-9381, Hudson, Wisconsin.

MEDICAL DIRECTOR for Non-Profit Women's Health Service in Minneapolis, Minnesota, being sought to direct its gynecology and abortion services. Responsibilities include supervision of medical personnel, general gynecology and contraception; experience in vacuum aspiration technique required. Must be sensitive to women's health issues. Salary negotiable depending upon qualifications and experience. Medical malpractice prepaid. Contact: Renee Ward or Robert McCoy, Midwest Health Center for Women, 825 South 8th Street, Suite 902, Minneapolis, Minnesota 55404.

EXPANDING TOWN in western Minnesota with new hospital seriously needs a larger medical staff. Family practice physicians, surgeons and internists. Please call P. W. Maus, M.D. at 612-769-4393 or Annabel Smith, Administrator at 612-769-4323.

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Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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President's Letter



Death and Dying

Death is a topic seldom discussed by the medical profession despite the fact that all of us face it every day in the treatment of our patients. Perhaps it is kept on the back burner of discussion because it is always a manifestation of our ultimate failure in patient care. Yet, despite the fact that the best possible medical and nursing care is given, and the most modern technological equipment is used to sustain life, we must face the inevitable — our patients are going to die — sometime.

Our entire medical training is directed toward one goal and one goal only — to sustain life. All of us work eight, 12, 14 hours a day using all of our training, knowledge, and experience attempting to help that patient get well, but we do not always succeed. I was going to use the phrase "*make* that patient get well." This, on second thought, sounds almost blasphemous, for we cannot really make anyone do anything, nor can we make the ultimate decision whether or not a patient is going to live or die. All we can do is apply our knowledge or training in an attempt to have that patient recover.

Why then this discussion of death? My reasons are two: (1) The feeling of uneasiness we all have about death is not becoming to an intelligent and honorable profession such as ours. (2) Discussions being bandied about on such things as brain death, definition of death, euthanasia, and right to life are all, it seems to me, being made out of context and being inter-related when they are really separate entities and should be discussed as such.

Why are we so prone to put off a discussion of impending death with our terminal patients? Perhaps because we have never been there, and, being human as well as doctors, we have a fear of the unknown. Perhaps, because of our lack of knowledge, we feel unfit to discuss the subject intelligently; perhaps we feel this is where the clergy come in, and we have no right to encroach on their territory. Perhaps, because we are so insecure within our own lives about a life after death or even an existence of any kind in any form after death. Perhaps it is a composite of all of these reasons and more that keeps us from taking the time to discuss the subject with out patients.

Fortunately, in my opinion, learned people are beginning to study the subject from the terminal patient's point of view, and we are becoming better informed as to how we should help them. I would suggest we avail ourselves of the printed material now available from these studies so that we can feel better equipped to help our patients during their final illness. Frequently, the immediate family is in as much need of guidance and suggestions as the patient.

Brain death, euthanasia, a right to life, definitions of death — all have become topics of major discussion primarily because of legislation or lack of legislation relating to these problems.

Euthanasia, "act or method of causing death painlessly so as to end suffering," shall be dealt with only to list it. Medical training is not directed toward this goal — to relieve suffering by medication yes, but not to end it by fostering death.

Right to life movement has a great number of supporters. Many of us in the medical profession feel that everyone has a right to life; and yet, the discussion gets sticky when one gets into the definition of when one is alive and when one is not. Who has the right to determine life or death? Does a mother have a right to destroy the product of conception? Does society have the right to take a life by capital punishment? Does anyone have the right to destroy another's life except in self preservation? These are all questions that arise, and I do not intend to go into a philosophical discussion on this.

Definition of death—brain death is, in my opinion, something that the medical profession can understand and should be able to discuss scientifically and unemotionally. Granted, the discussion of this subject usually involves premature death of an adolescent or a younger adult; and, as a result, more emotion arises among those involved than it would were it to occur

among the senile, aged or already incapacitated aged.

Brain death can well be defined and technologically demonstrated by present acceptable scientific means, and it is for this reason that I say the medical profession should be able to discuss it unemotionally.

A completely flat brain wave tracing over a prolonged period of time is sufficient for us to accept brain death. No doubt there will be some who still insist there might be a possibility of recovery. Are we justified in carrying out other life-supporting mechanisms to keep a heart pumping and lungs expanding when the brain function is gone? That is the crux of the problem.

Do theologians have a right to get into this discussion and aid us in determining when the soul has left the body? Where in the mortal body does the soul reside? In the brain, the heart, or where? Those of us who were brought up as Christians believe there is a soul. If so, where does it dwell, and when does it leave the body? If it has left the body, is that body already dead? Perhaps this is a situation where theology and medicine can work together to come to an acceptable solution.

I am sympathetic with those who say we need no law. Doctors with the help of the patient's family have been making these decisions for years. Let them keep on doing so. If the courts were the same, the jurors the same, and the judges the same, I would say yes, by all means, leave well enough alone.

Unfortunately, this is no longer the case. In this modern, suit-conscious society we are all practicing medicine to the best of our ability without having the added tension of wondering if we are opening ourselves up to a lawsuit if in our good judgment, we "pull the plug" so to speak. Even after discussions with the family and obtaining its consent are we still subject to legal prosecution? If a law defines death as brain death defined by . . . then I at least have a dependable base line. If it is confined to this one definition and this one circumstance, it seems to me, it cannot be interpreted any other way.

This is indeed a controversial subject. I am sure there will be letters written both pro and con, and the editors and I welcome these. I am not expounding MMA philosophy or policy. I am taking the prerogative offered me as your President to voice my own personal opinions on these matters. I feel you have a right to voice yours.



C. A. Anderson, M.D.
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Editor's Notebook

Wordupsmanship in Medicine

"There is nothing wrong, really, with any word — all are good, but some are better than others."

E.B. White
Elements of Style

Wordupsmanship is the game of using words to win discussions without knowing facts. To impress and not to inform are basic ingredients of wordupsmanship strategy. With word gambits, you prevent conversational flow from spilling into your pockets of ignorance. Your weapons are precise sounding words with imprecise meanings. You use these weapons to maneuver opponents into the shadows. In this essay, I shall discuss words with which to play the game.

Reasons for Wordupsmanship

Specialization, rise of basic sciences, exploding information and the public's increasing medical awareness have eroded the physician's image as an omniscient person. *To regain our position as repositories of infinite wisdom, we have three choices:* (1) *to learn more about less;* (2) *to learn less about more; or* (3) *to learn more about less while appearing to learn more about more.* The key word in the last choice is "appearing" and forms the essence of wordupsmanship.

Controlling the Game

To control the game, vary your approach to suit your adversary. With specialists who inflate language with high sounding abstractions, reverse wordupsmanship — asking for a definition — will often produce decerebrate rigidity, or even complete cerebral shutdown. Chances are, the specialist has never been asked to define what he means. In any event, reverse wordupsmanship breaks verbal flow by creating doubt in the specialist's mind. Thus, you offset his expertise by simply asking a question, meanwhile establishing yourself as someone with Socratic insight.

If, on the other hand, your antagonist is a generalist with broad clinical experience, your objective is to push him into a remote corner of knowledge unrelated to patient care. Employ meaningless technical jargon in these circumstances, for it will often render your opponent speechless at your apparent profundity.

Choosing Words

Choose words carefully before lunging. Pick abstract words with scientific connotations. But keep in mind that bureaucratic words showing social concern are good too. Do not hesitate to spawn new

expressions. Creative neologisms indicate originality, impress, and confuse — all at the same time. Interject literary terms, or speak poetically, e.g. "harvest" serum rather than collecting it. As a wordupsman laureate, you have two purposes: to reveal a renaissance virtuosity and to rise above mere scientific quibbling.

Be malleable: corrupt words to mean something different than what they started out to mean. Words are currency, and with your quicksilver mind, you can either debase or inflate their meanings and dazzle your listener.

Words for Wordupsman

I suggest these words as a foundation for your verbal armamentarium:

1. Armamentarium — The meaning of armamentarium — the equipment and methods used in Medicine — is clear. Therefore its usefulness is restricted. Its virtues are its length (13 letters), its Latin origin (L. *armamenta,* utensil, army or naval equipment), and its sonorous sound. While you are rolling it off your tongue, you can stall and grope for a more amorphous term.

2. Biome — "The dissection of pickled frogs has been replaced by a laboratory biome which the student himself assembles and manipulates and thus learns how various forms of life are related."[1]

Biome is a potent addition to the wordupsman's sheaf of blunt nosed verbal arrows. It possesses singularly attractive features: (1) it has not been absorbed by reputable dictionaries; (2) it has graced the pages of a leading publication; and (3) it has *bio-*, life, as a prefix. Adding *bio-* to any word is artful wordupsmanship. It creates a sensation of biological flux and gives the impression you comprehend life. If, after using biome, your opponent asks you to define it, tell him that biome is a contraction of *biometry,* which is, of course, a measurement of the probable duration of life or a branch of biology which deals with data statistically or by quantitative analysis. Your opponent's cerebral dissociation will follow.

3. Clinically — This timeworn, but faithful, companion is unmatched when your diagnosis is not corroborated by facts. Immediately you add personal perspective, and, if you are adroit, you cannot be contradicted. If your opponent quotes authoritative information alien to your opinion, add "in my experience" to extricate yourself.*

4. & 5. Congeners and Moieties — Asking the definitions of these words jams the pathways of millequivalent followers. Wait until your opponent mouths either word, then strike. Reduce him to fumbling incoherence with these tactics. After all, you ask, doesn't congeners mean something resembling another in nature and action? And doesn't moiety mean one of two equal parts? If his brain substrates start to crumble from the impact, abolish him. Feint with humor by telling him that congeners in alcohol make it a running riddle and a fluid answer, then overwhelm him with scientific objectivity by defining moiety as a non-nitrogenous residue of an amino-acid resulting from deamination.

5. & 6. Continuum and Spectrum — The zenith of the wordupsman's art is to superimpose a continuous stream (a continuum) of words onto a series of verbal images (a spectrum). These Latin expressions offer a double-barrelled opportunity to disappear in a cloud of ambiguity. Poorly understood diseases yearning for classification suddenly fall neatly into

*"In my experience" is known as *The Hippocratic Escape Gambit in* Wordupsmanship.

commodious receptables of nosological refuge. Build your containers as wide and as deep as possible to assure generalizing space. If the patient's symptoms and signs are suggestive, but indefinite, call the disease a *forme fruste* and place it in a proximal portion of the spectrum. With a remote history and no clinical or laboratory correlation call the disease "burned out" and place it in a distal continuum.

7. & 8. Dynamic and Kinetic — These words are considered together because of their dynamic interrelationships. Unveil them in situations in which your information is restricted to a stagnant aspect of a subject. As in politics, dynamic teams with vigor, movement, and progress. Kinetic is, of course, scientifically dynamic and also suggests heat, thereby increasing the verbal Brownian movement. Your stunned opponent, thinking of the labyrinths of biokinetics or biodynamics or biodynamothermokinetics, promptly develops a massive mental impaction. If he rallies with a clear thought, mix dynamic and kinetic to increase turbidity.

9. Methodology — Whenever possible, substitute methodology for method. Methodology implies that the method is under study and is therefore in an unsettled state. And if the study of a method is under active evaluation with controlled studies of its modifications by double blind techniques, who can say anything concrete about the present method?†

10. Modality — The utility of modality stems from its scientific sound and its dubious meaning. Derived from the Latin word, *modus*, a measurement, it evokes an image of precision. Invariably your opponent's weakness is his belief that measurable diseases are curable diseases. But use modality to qualify not to quantitate. Modality is a two-edged sword with dull edges — in therapy it is any agent of treatment, and in disease, it signifies any condition modifying drug action. Swing it both ways. If any adversary attempts to parry, press home your advantage. Explain that its true meaning in logic is that qualification of propositions according to which they are distinguished as asserting (or denying) the possibility, impossibility, contingency, or necessity of their contract,[3] but that clinically it reflects the various heterogeneous parameters of therapy.‡ Critics are left holding a bag of word salad.

11., 12., 13. Sophisticated, Esoteric and Elegant — Evading direct questions with style and eloquence is the stamp of a true wordupsman. Sophisticated, esoteric, or elegant reek with refined dignity. They also show exquisite taste and suggest refinement beyond your opponent's grasp. Use these words when discussing the techniques of your own specialty or your own hospital to convey scientific excellence.

These words can also be used negatively. Refer to other specialties or institutions as "too sophisticated" to indicate snobbery and lack of human warmth. If your opponent threatens to score with information you do not comprehend, sneer and disdainfully allude to his comments as "esoteric", i.e., not practical for physicians who *really* understand the *fundamentals* of patient care and hospital problems.

These words are suggested as a starting point for the aspiring medical wordupsman.

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†This technique of channelling direct questions into scientific babble is known as the *Under Study Gambit* by wordupsman. If the adversary is reduced to silence, the wordupsman has achieved *Glaciation*.[2]

‡The juxtaposition of various and heterogeneous is an example of the *Double Diffusion Gambit*.

Other Forms of Wordupsmanship

Lack of space and time prevent me from explaining other forms of wordupsmanship.

I will not, for example, be able to dwell on *reportsmanship* — a form of wordupsmanship practiced by in-house specialists such as pathologists and radiologists. In their reports, these specialists stick to these fundamentals: (1) Make the length of the discussion directly proportional to the uncertainty of the diagnosis; (2) with uncertain diagnosis, compose an exhaustive list of possibilities, but remain neutral by showing no favoritism towards any specific diagnosis; (3) what you give away in the discussion, take back with the diagnosis, and vice versa; and (4) never commit yourself unequivocally, always have room to withdraw. All of these fundamentals require certain phrases that must be plugged in to achieve scientific objectivity. Pathmanship terms include: "consistent with, but not diagnostic of", "compatible with, but not pathognomonic of", "it is felt," "see discussion," "raises the question of," "mitigates against the diagnosis," "possibility of mesenchymal origin," "premalignant lesion of reticuloendothelial system." Radiologic reportsmanship is, of necessity, more shadowy in phrasing and is beyond my comprehension.

of any discipline and who often hangs out in teaching centers. These specialists find these expressions useful when short of facts or stumped for explanations: "one wonders," "so called," "exceedingly rare," "not uncommonly," "the literature says," "essentially within normal parameters," "they say," "entertain a diagnosis," and, finally, the irrefutable "we see that."

I will not have time to discuss the techniques of out-house specialists, although they too practice a fertile brand of wordupsmanship.

Two final forms of wordupsmanship are: *healthplanningmanship* and *socialconcernmanship*. Notice how I run the words together in identifying these types of wordupsmanship. Why? Simply because you must think of words in running clumps when employing these ploys. For example, in *healthplanningmanship,* you have such polysyllabic beauties as *unfundedhighpriritygoals, non-fundedlowpriroritytargets,* and *comprehensivezerobasedlongtermbudgetingobjectives*.

In socialconcernmanship, which is the art of showing your concern when your own interests aren't involved, you mix various combinations of these words: "meaningful," "societal," "seminal," "dialogue," "relationships," "interrelationships," with scientific abstractions. Meaningful examples would be: *meaningfulsocietaldatabase, meaningfulseminalinterrelationships,* and *meaningfulhighpriority-dialogue*. As I pointed out in a previous article,[4] the easiest way to use this technique is simply to arrange your words in three columns — two qualifying adjectives and an abstract noun — and run them together in any order.

1	2	3
total	management	care
regional	supportative	coordinator
universal	health	analyses
primary	integrated	centers
comprehensive	ambulatory	services
national	resource	priorities
quality	pilot	planning
interdependent	involvement	needs

1	2	3
preventive	paramedical	studies
systematized	effectiveness	utilization
feasible	digital	implementations
delivery	scientific	objectives
unmet	outreach	systems
community	allied	maintenance
centralized	medical	parameters
longterm	multiphasic	feedback
meaningful	high priority	crises
social	low-priority	goals
funded	pro-based	dialogue
relevant	concerned	targets
seminal	related	objectives
viable	support	budgets

Dynamic Ending

In all these forms of wordupsmanship, remember these maxims — never confess ignorance, never say what you mean, and be vague with dignity.

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Annual Meeting

MMA 1978 Annual Meeting, Duluth, Minnesota

Surgical Management of the Hemorrhaging Patient

6 credit hours — Friday, May 12

This program is designed not only for the surgeon but primary physicians as well, to familiarize them with the many different presentations of massive hemorrhage, pre-operative evaluation in terms of coagulation disorders, gastro-intestinal hemorrhage, pelvic trauma and epistaxis.

The Practitioner's Approach to Neurological Problems

3 credit hours — Thursday, May 11

The educational objective of this CME course is to teach primary physicians how to approach the common major neurological problems faced in practice, the evaluation necessary to properly identify the disorder and the treatment programs that can be instituted by the practitioner will be taught. Physicians who complete this course will be able to (1) identify each of the major disease entities discussed, (2) distinguish them from other clinical neurological disorders, (3) know when to refer the patient for specialist's evaluation and (4) institute emergency treatment when needed and all treatment of patients who do not need evaluation by a specialist.


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Characteristics Common to Cutaneous Infections with Mycobacterium Marinum

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A study of eight persons with cutaneous infection caused by *Mycobacterium marinum* is presented. This includes bacteriological aspects, brief epidemiological data, drug sensitivity, source of infection and suggestions for prevention of infection.

LABORATORY PROGRESS in speciating the mycobacteria has resulted in *Mycobacterium marinum* (balnei) being identified with increasing frequency as one of the etiologic agents of granulomatous lesions of the skin.[1–6,9,11] The skin lesions resulting from this acid-fast bacillus infection may assume a pattern resembling sporotrichosis.[4,6,9]

Mycobacterium marinum was first described in 1926 by Aronson[8] who isolated the bacterium from lesions found in various organs of salt water fish found dead in tanks at the Philadelphia aquarium. The lesions resenbled in some respects tubercles in mammals. Linell and Norden[1] in 1954 described an acid-fast bacillus *Mycobacterium balnei* capable of producing ulcerative cutaneous lesions in patients who had histories of having scraped their elbows in a swimming pool. The growth and cytochemical characteristics of *Mycobacterium marinum* and *balnei* are identical.[13] According to the rules of nomenclature *Mycobacterium marinum* takes priority over the species name *balnei*.[15] The purpose of this publication is to emphasize: (1) the common as well as the rare sources of cutaneous and subcutaneous sporotrichoid forms of granuloma due to *M. marinum*, (2) the importance of the patient's history of exposure, (3) laboratory identification of the microorganism causing the lesion, and (4) the need to inform the laboratory of the kind and source of specimen and the suspected diagnosis.

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This study was supported in part by Minnesota Lung Association and by the Minnesota Department of Health.

Materials and Methods

Specimens were mailed to the mycobacteria laboratory in containers provided by the Minnesota Department of Health Laboratory (MDHL). Each specimen was accompanied by a data card "Culture for acid-fast bacilli" on which was requested the patient's name, residence, physician's name, address, kind and source of specimen, and clinical diagnosis.

If the data card indicated the specimen was "skin" or the tentative diagnosis was suggestive of a skin infection, the tissue was ground in a mortar and diluted with a small amount of 0.85% NaCl solution. An aliquot of the diluted ground tissue was inoculated onto three tubes of Lowenstein-Jensen medium. One tube was incubated at 37° C., one at 32° C., and one at room temperature. The remainder was digested with an equal volume of 4% NaOH. After 30 minutes or less the digestion process was neutralized with IN/HCL This specimen was centrifuged, at room temperature, for 30 minutes at 3,500 RPM. The supernatant was aspirated off the sediment. A glass slide for acid-fast stain and microscopic examination was prepared from a portion of the sediment, the remainder was inoculated onto four tubes of Lowenstein-Jensen medium (two tubes were incubated at 37° C., one at 32° C., and one at room temperature), also two tubes of modified Petragnani medium were inoculated and both incubated at 37° C. Cultures were examined weekly for eight weeks. Cultures showing growth of acid-fast bacilli were reported and further studies were made to speciate the organism. Sensitivity studies were done with INH, rifampin, and ethambutol.

A follow-up request for information was sent to each physician attending the patient from whom *M. marinum* was isolated. The information requested was

TABLE

Events of Cutaneous Infections — *Mycobacterium Marinum*

Patient Identification Age, Sex, Residence, Occupation	Date of Onset	Tentative Diagnosis	Kind and Date of Specimen to Lab.
1. Age 16, male Residence - St. Louis County Student	8/71	Granulomatous synovitis distal phalanx right finger	Referred "Cult. from cyst right index finger for identification" 3/31/72
2. Age 57, male Residence - Hennepin County Businessman	11/73	Suspected sporotrichosis	Tissue from left thumb 11/16/73
3. Age 65, female Residence - Brown County Housewife	1973	Arthritis and tenosynovitis left wrist and hand. Treated for "gout" previous to 6/74.	Tissue from extensor surface of joint, third finger left hand 6/7/74.
4. Age 55, female Residence - Hennepin County Housewife	1/74	Infection right thumb	Tissue from right thumb 3/15/74
5. Age 29, female Residence - Dakota County Housewife	7/74	Nodular skin infection left thumb and hand	Tissue left thumb 9/30/74
6. Age 51, female Residence - Scott County Housewife	10/75	Infected nodules left forearm, dorsum left hand and cuticle third finger left hand	Swab with purulent material from nodule dorsum left hand 1/7/76
7. Age 24, female Residence - Ramsey County Key punch operator	11/75	Chronic granulomatous process index finger left hand. Patient's first visit to Doctor's office 4/26/76.	Tissue index finger left hand 5/5/76
8. Age 79, female Residence - Ramsey County Housewife	1/76	Dermatitis, swelling and nodules right arm 3/11/76. History of five weeks eruption right arm.	Tissue right arm 3/12/76

*Original specimen not received in MDHL, referred culture submitted for identification of organism.

TABLE *(Continued)*

Events of Cutaneous Infections — *Mycobacterium Marinum*

Lab. Results: Direct Microscopic	Lab. Results: Date Cult. Rept'd +	Final Diagnosis	Treatment and Outcome	Probable Source of Infection
*(?)	4/27/72	Mycobacterium synovitis right index finger	INH, Ethambutol 4/72 - 12/72 Condition resolved with a degree of deformity. Unable to extend distal phalanx right index finger.	Cleaned guppy aquarium at home 6/71. Also ocean fishing, cleaned fish, "Thought infection originated from splinter".
Neg.	12/13/73	Mycobacteriosis left thumb	Soaked hand in super-saturated KI repeatedly Nov.-Dec. '73. Two small red-purple macules and biopsy scar left. Condition resolved.	Cut thumb when shelling oysters, sent from New Orleans.
Neg.	6/27/74	Mycobacteriosis left wrist and hand	INH, Pyridoxine, Ethambutol 6/27/74 to continue for one year. 8/9/74 doing well slight deviation of wrist, ulnar side.	Cleaned aquarium "Son is in fish business".
Neg.	4/18/74	Mycobacteriosis right thumb	Ethambutol, INH, Ethionamide 4/74-7/74 Inactive 7/74.	Cleaned fish tank 11/73 after fish died. "Patient thought she had sliver".
Neg.	10/30/74	Mycobacteriosis left thumb and hand	Ethambutol 11/74-4/75. Condition resolved. No evidence of abnormality 4/75.	Cleaned aquarium at home.
Pos. AFB	1/27/76	Mycobacterium marinum	Ethambutol, Rifampin 2/76. Condition resolved. Slight inflammation around cuticle. Therapy continued.	Has had an aquarium for 20 years, which she cleans.
Neg.	6/1/76	Mycobacterium marinum	Lesion excised and skin graft 5/4/76. Progress satisfactory. Lesion healed 7/22/76.	Cleaned fish tank prior to onset of symptoms.
Neg.	4/22/76	Mycobacteriosis right arm	Rifampin 4/16-4/28/76. Ethambutol 4/28-6/76. Doing well when last seen in May 1976.	Cleaned an old aquarium Jan. 1976. Had a small burn on right third finger.

the physician's final diagnosis, date of diagnosis, treatment, patient's occupation, probable source of infection, and the physician's opinion as to the significance of the organism in relation to the patient's illness.

Results and Discussion

The Table "Events of Cutaneous Infection — *Mycobacterium marinum*" shows six of the eight infected persons in our study were female of which five gave their occupation as "housewife". All patients, except patient 2, male, age 57 who cut his thumb when shelling oysters, gave a history of having cleaned their fish aquariums prior to the onset of symptoms. Adams et al.[4] reported three cases, a 56-year-old female electronics technician, a 35-year-old physician, and a 35-year-old housewife. Each had been exposed to water in their fish tank approximately three weeks before the appearance of the skin infections. In all instances each patient experienced a minor abrasion on the hand during or prior to cleaning of the aquarium where many of the fish had recently died. Swift et al.[2] reported two cases, a 37-year-old female who operated a pet shop cut the right third finger on the metal band lining the top of a tropical fish tank and her 18-year-old son cut the left middle finger on the same fish tank. Each developed elevated pea-sized red nodules which in the 37-year-old female were both distal and proximal to the site of laceration. In the 18-year-old son a single pea-sized granuloma appeared on the dorsum of the hand. Heineman et al.[5] reported an infection in a 32-year-old man who was a water pollution inspector but had little contact with polluted water. He gave a history of having abraded the fifth finger of his right hand while tying string. Subsequently he noted several red nodules along the volar aspect of the forearm. On physical examination he displayed no abnormalities except for raised marginated, slightly scaly, firm erythematous lesions on the right fifth finger and volar surface of the wrist and forearm. On questioning the patient it was discovered that he kept two tropical fish tanks in which some of the fish had died. Sediment from both tanks revealed a large number of acid-fast bacilli. It is obvious the fish aquarium or tank contaminated with *M. marinum* is a source of infection in man.

In our experience, shown in the Table of this report, the ages of the infected persons ranged from 16 to 79 years. Lincoln et al.[10] in a review of the literature stated hundreds of cases have been reported but ages of the patients frequently are not given. Of 174 patients whose ages were reported 155 were between ages 10 and 16 years. Age does not appear to be a factor[4,5,9] except in large outbreaks involving swimming pools[1,7] a place most often frequented by teenagers and younger. Exposure of abraded or open wounds of the skin to water containing *M. marinum* is a determining factor of infection.

Epidemics of granulomatous skin lesions infected with *M. marinum* have been reported.[1,3,7] The lesions in swimmers are usually at the site of the abrasion, the knees, ankles, elbows, and dorsa of the feet and hands, acquired in rock lined swimming pools or in cement pools with rough surfaces in which the water and walls harbor *M. marinum*.

Sources of infection other than fish aquariums, fish tanks, and swimming pools do occur. Case 2, shown in the Table of this report acquired his infection when he cut his thumb shelling oysters. Dickey[9] described an infection in a 37-year old female secretary employed in a woolen mill. Three weeks prior to the appearance of the primary lesions on the dorsum of the right little finger she had treated the sore leg of her horse by immersing and bathing the leg in "old contaminated well water". The patient recalled a slight trauma to the affected finger at that time.

Perusal of the Table presented in this publication as it pertains to "Tentative Diagnosis" and "Final Diagnosis" shows the attending physician accepted *Mycobacterium marinum* as the causal agent of the infection in each of the eight cases reported. This observation coupled with reports in the literature regarding the resemblance of the lesions observed in sporotrichosis[4,6,9] emphasizes the necessity for bacteriological, mycological, and histopathological studies of tissues removed from cutaneous granulomas, ulcers, and abscesses in order to identify the etiologic agent.

When submitting specimens to the laboratory to be cultured for Mycobacteria it is very important to inform the laboratory of the source and kind of specimen so that the cultures for acid-fact bacilli will be properly processed and incubated at the appropriate temperatures. The optimum growth temperature for *M. marinum* is between 30°-33° C. as opposed to *Mycobacterium tuberculosis* which is 37° C. Attempts to grow the bacilli outside the optimum temperature range could result in no growth and thus, if present, miss the detection of the bacilli.

We received tissue or purulent material for culture from seven of the eight patients in our study. A culture of acid-fast bacilli was submitted for identification from the other patient. Acid-fact bacilli were found by microscopic examination of the concentrated and

stained sediment of the specimen from only one patient. In contrast *M. marinum* was demonstrated on culture from all specimens The culture as opposed to the microscopic examination of the concentrated and stained sediment is the most sensitive test for the detection of acid-fast bacilli. In addition the culture provides exact data and an opportunity to test the sensitivity of the bacilli to chemotherapeutic agents

Of the three chemotherapeutic agents, INH, ethambutol, and rifampin tested in our laboratory, we found *M. marinum* to be completely sensitive to ethambutol at two micrograms per ml. According to the information received in this study from the physicians, ethambutol or ethambutol in combination with one or more chemotherapeutic agents was used effectively in clearing up the patient's infection. Wolinsky et al.[6] reported a case which responded well to treatment with a combination of rifampin and ethambutol. Van Dyke et al.[14] reported treatment of two patients using ethambutol and rifampin and recommended the combination because of their clinical efficacy and minimal toxicity. They also state "from the review of the literature and the author's experience, it appears that therapy should be continued for at least 12 to 18 months, and, in cases of extensive infection for at least 24 months".

Of interest as it relates to treatment are two patients listed in our Table, patient 2, who "soaked hand in super-saturated KI" and patient 7, who had "lesions excised". Neither received antituberculosis chemotherapy. In the case of patient 2, it was reported "condition resolved" and in case of patient 7, "lesion healed". Reports[2,7,11] of cutaneous infections with *M. marinum* healing spontaneously over a period of a few weeks to two years have been made.

Information regarding tuberculin skin testing was received for six of the eight patients presented in our study. The tuberculin skin test was reported positive for three patients, no test done in three, and no information was obtained for two patients. Reports in the literature show a high percentage of persons infected with *M. marinum* become reactive to tuberculin. Schaefer et al.[12] in their evaluation of 56 children infected with *M. marinum* reported 48 had a positive intradermal reaction to 0.1 mg. old tuberculin 18 months or more after the appearance of skin lesions. Comparative skin reactions with tuberculin prepared from *M. marinum* was not significantly different from those produced by the corresponding old tuberculin. This observation becomes important in routine tuberculin skin testing surveys since Schaefer et al.[12] have observed that *M. marinum* can cause a nonspecific sensitization to tuberculin.

It is an enigma that cases of skin granuloma due to *M. marinum* do not occur more often when one considers the number of people exposed to swimming pools and to water in the fish aquariums and tanks. In any event certain precautions to prevent infection can be taken by persons who own a fish aquarium or tank. One should wear rubber gloves when cleaning a fish tank or aquarium. The water from these containers should be disposed of in the toilet bowl or other outlet leading directly to the sewerage system. Never should the water be poured into the kitchen sink, bathtub, or bathroom handwashing bowl. The dead fish should be placed in a water proof plastic bag and incinerated or disposed of in such a manner to prevent contamination of the environment. Contaminated swimming pools should be disinfected and surfaces made smooth to minimize chances for swimmers to abrade their skin. The usual chlorination and proper maintenance of the swimming pool water and chlorinating equipment is essential.

Conclusions

1. Water in the fish tank or aquarium contaminated with *M. marinum* is a common source of infection.
2. Abrasions or lacerations of the skin are predisposing factors to infection of the extremities.
3. Infections reported to date involve only the extremities.
4. Cultures for acid-fast bacilli of specimens removed from cutaneous granulomatous ulcers and abscesses should be done, and as indicated in the literature mycological and histological studies should be included.
5. Information as to the kind and source of the specimen should be given to the mycobacteria laboratory so that cultures are incubated at appropriate temperatures.
6. Of three chemotherapeutic agents tested, INH, rifampin, and ethambutol, *M. marinum* was most sensitive to ethambutol.
7. The person who cleans the fish tank or aquarium which in our observation was most often the "housewife" is the most probable person to get an infection from this source.

Acknowledgments

The information regarding the patient was provided by the patient's attending physician.

References will be found on page 95.

Diagnosis of an Intrahepatic Abscess

Using Techniques of Nuclear Medicine

MICHAEL T. NELSON, M.D.* and MERLE K. LOKEN, M.D., Ph.D.†

This report illustrates the use of sequential liver-spleen and renal nuclear imaging procedures as aids in establishing the diagnosis of an intrahepatic abscess in a pediatric patient. The liver-spleen scan was performed using ^{99m}Tc sulfur colloid, and the renal scan with a chelate, diethylenetriamine pentaacetic acid (DTPA) labeled with ^{99m}Tc, which is gradually cleared by glomerular filtration.

WITH THE ADVENT of multiple non-invasive techniques for imaging the human body, one must choose the modality or modalities which will have the greatest potential for providing useful diagnostic information. The following case report illustrates the use of two nuclear imaging procedures, liver-spleen and renal scans, for localization of an intrahepatic filling defect. At surgery this defect was found to be an abscess.

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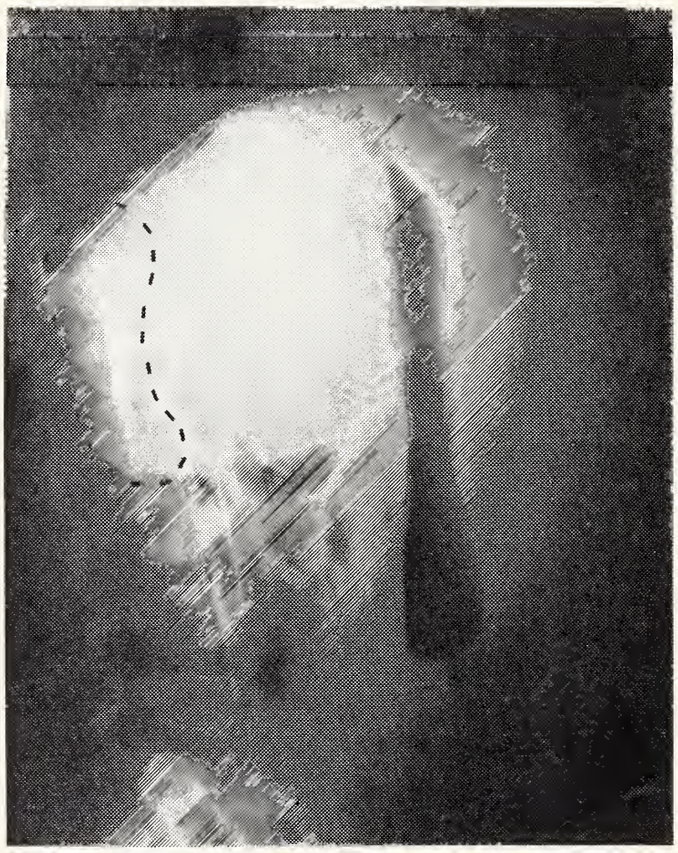


Fig. 1 Lateral film from I.V.P. showing an unusually high location of the right kidney.

This report relates to a two-year-old white female admitted to the hospital for evaluation of hepatosplenomegaly On physical examination the liver was found to extend eight centimeters below the right costal margin and the spleen to be palpable two centimeters below the costal margin on the left. Laboratory studies showed serum levels of SGOT and alkaline phosphatase to be elevated. She exhibited cyclic neutropenia, an abnormality found previously in two other family members, the child's mother and maternal grandfather. Radiographs of the chest were normal. An intravenous pyelogram showed an unusually high location of the right kidney (Figure 1); the I.V.P. was otherwise normal. An examination of the upper gastrointestinal tract was normal.

A liver-spleen scan, performed after administration of one millicurie of ^{99m} technetium sulfur colloid, revealed two filling defects in the liver (Figures 2a, 2b, 2c). The differential diagnosis for these filling defects visible on several of the views of the liver included: metastatic disease, abscesses, and/or focal barium deposits. Consideration was also given to the mal-positioned right kidney as the cause for the filling defect in the superior aspect of the liver, seen best on the posterior view. To further evaluate this latter diagnostic possibility, a combined liver-spleen and kidney scan was performed. ^{99m} Technetium sulfur colloid was administered for a second scan of the liver and spleen. This scan showed a single large filling defect within the superior-posterior aspect of the right lobe of the liver. The second filling defect seen on the

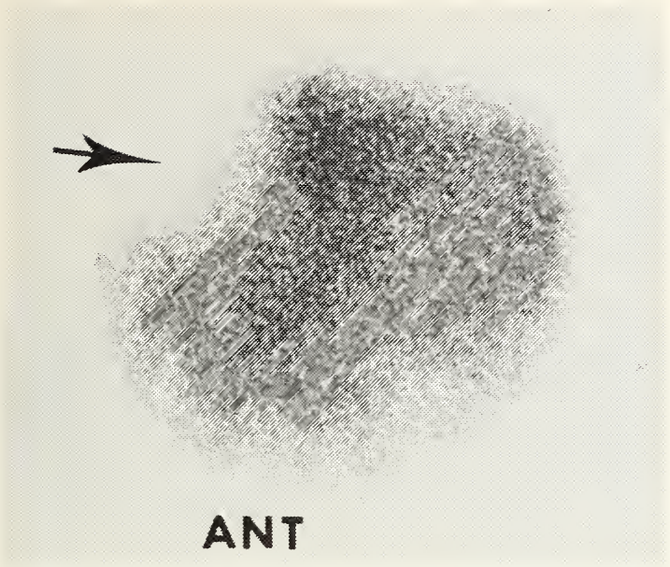


Fig. 2a Anterior liver scan showing large focal defect in the right lobe of the liver superiorly.

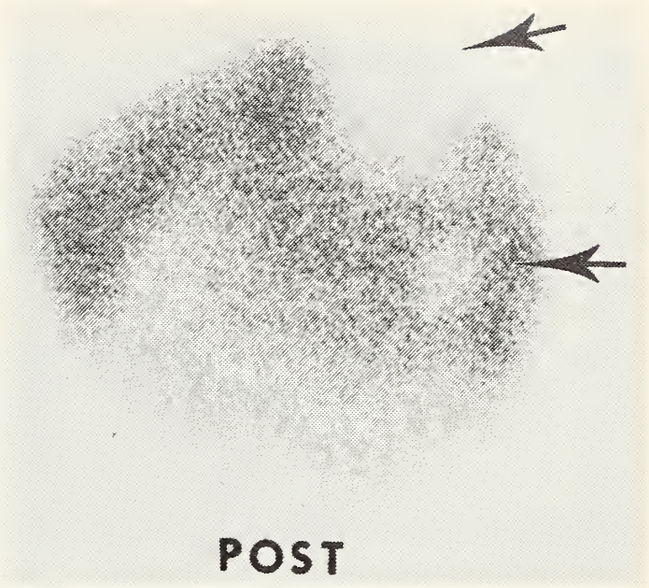


Fig. 2b Posterior view of liver scan showing two defects in the right lobe of the liver.



Fig. 2c Right lateral liver scan showing a single large defect in superior aspect of the liver.

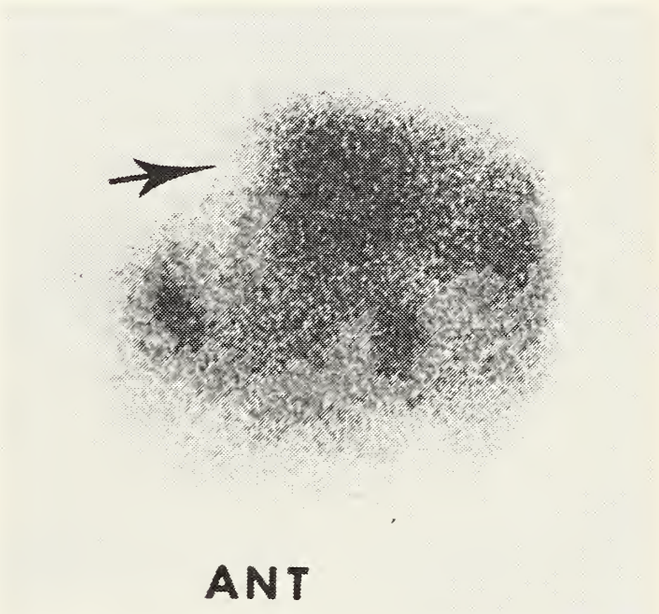


Fig. 3a Anterior-posterior view of combination liver-renal scan showing the right kidney to lie below the defect in the liver.

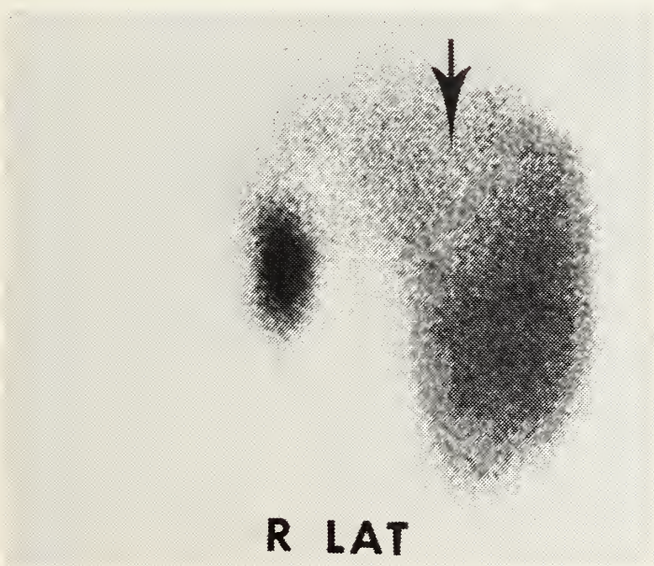


Fig. 3b Right lateral view of liver-renal scan showing the right kidney to be somewhat smaller than the liver defect and to lie posterior to it.

initial liver-spleen scan was no longer visible and was presumed, therefore, to have been due to barium within the bowel overlying the liver.

One millicurie of ^{99m}Tc DTPA was then injected to visualize the kidneys and to permit the anatomic relationship of the kidneys to the liver and spleen to be studied (Figures 3a,3b). The right kidney was found to lie posterior and inferior to the liver filling defect. This was most evident on the right lateral view.

Because of the patient's febrile course and cyclic neutropenia, it was concluded from the above studies that the filling defect in the posterior-superior aspect of the liver was most likely to be a liver abscess. An ultrasound study demonstrated that the abnormality in the region of the right lobe of the liver had a cyst-like structure; however, it could not be determined whether the mass involved the liver or was located in the retroperitoneal space. A computerized tomographic (CT) body scan was also performed. The sectional scans from this study showed irregular areas of decreased attentuation within the liver compatible with a liver abscess.

The child was taken to surgery and a partial hepatectomy was performed. Histologic sections from the surgical specimen revealed a well organized abscess. A culture from the specimen grew out gram negative bacteria. The child has done well postoperatively.

Summary

This case of a young child with cyclic neutropenia illustrates the importance of employing appropriate sequential nuclear imaging of the abdominal organs with selected radiopharmaceuticals to establish the diagnosis of a liver abscess. Ultrasound and ACTA body scans were included in evaluating this patient as part of a departmental study of the merits of various imaging modalities in assessing abdominal problems. Although all three procedures correctly identified the presence of an abnormality associated with the right lobe of the liver, the combination scintiscan of the liver-spleen and kidneys was the single most important study in establishing the appropriate diagnosis in this patient with an intrahepatic abscess.

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MINNESOTA MEDICINE

The Board of Editors of MINNESOTA MEDICINE invites the members of the Minnesota State Medical Association to submit examples of their art work for publication on the cover of MINNESOTA MEDICINE. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of MINNESOTA MEDICINE, 101 East 5th St., Suite 900, St. Paul, Minnesota 55101.

Farrell Stiegler, M.D.
Cover Editor

Heparin Insensitivity Responding to Fresh Frozen Plasma

NICHOLAS F. REUTER, M.D.*

A 54-year-old-white man had left cerebrovascular accident followed four weeks later by right leg thrombophlebitis and pulmonary embolism. The patient was initially treated with IV heparin 6,000-10,000 units every four hours to a total dose of 81,000 units in 40 hours, without response as indicated by the partial thromboplastin time (PTT). An additional dose of 10,000 units of heparin was given and the PTT and thrombin time were normal five minutes after injection. The patient was then given one unit of fresh frozen plasma containing 10,000 units of heparin. The PTT immediately increased to therapeutic levels and remained elevated with the usual doses of heparin over the next eight days. A deficiency of antithrombin III factor may have caused his resistance to heparin.

HEPARIN IS commonly used as an anticoagulant in patients who have thrombophlebitis and pulmonary embolism. Heparin is also used as an anticoagulant in vascular surgery, cardiopulmonary bypass procedures and in some arteriographic radiologic studies. Failure of heparin to give adequate anticoagulation in these situations could cause increased morbidity or mortality. A patient with heparin insensitivity is presented.

Case Report

A 54-year-old-white man suffered a left cerebrovascular accident in December 1975, causing a complete right hemiplegia and aphasia without loss of consciousness. Three and one half weeks later he developed a right thigh thrombophlebitis followed by pleuritic left chest pain and dyspnea.

Past medical history was negative for hypertension, diabetes or elevated lipids. Lower extremity varicose veins had been present since age 14. He was on no medications.

Physical examination showed an alert, normotensive, afebrile man with aphasia, dyspnea and moderate pleuritic pain. Auscultation of the lungs revealed rales but no pleural rub in the left lateral chest. The lower extremities had varicose veins with a swollen tender red cord formation involving the medial right thigh.

Pertinent Data

Arterial blood gases while on O_2 at 6 liters/minute revealed a pCO_2 of 28mm and a pO_2 of 59mm. Urinalysis, CBC, platelets, protein electrophoresis, protime, PTT, sed rate, electrolytes and SMA_{12} were within normal limits except for an LDH of 286 units. A chest Xray showed a left lower lobe infiltrate and blunting of the left costophrenic angle. A lung scan disclosed bilateral perfusion defects.

Hospital Course

The patient was immediately started on intravenous heparin therapy. See the Figure for time-dose relations of heparin and clotting parameters. When there was no response of the PTT or thrombin time to the heparin therapy, a different lot of heparin was used and the laboratory procedure and reagents were re-evaluated. The same lack of response persisted.

The patient was then given one unit of fresh frozen plasma containing 10,000 units of heparin with an immediate elevation of the PTT. Heparin was continued at 5,000-6,000 units every four hours over the next week with appropriate PTT responses. Coumadin was started on admission and adjusted to keep the protime at about twice the control. The patient has subsequently done well.

The patient, while receiving Coumadin, was later given a rechallenge dose of heparin, (6,000 units) with an appropriate PTT and thrombin time response. An antithrombin III analysis at this time was normal. A repeat antithrombin analysis as described by Innerfield, et al.,[1] was done six months later when Coumadin had been discontinued for one week and was found to be significantly decreased at 68% (nl. > 80%).

Discussion

There are several factors that may cause a patient to be resistant or insensitive to heparin. A patient with adenocarcinoma of the breast and IgM paraproteinemia is described who had a bleeding tendency and an insensitivity to heparin due to an anomalous interaction between the paraprotein and heparin.[2] Also reported is a patient with an IgG, K type paraprotein who had three thrombotic events that cleared after

*University Unit for Teaching and Research in Internal Medicine, Northwestern Hospital, Minneapolis.

administration of extremely high doses of heparin.[3]

Several studies report antiheparin or heparin neutralizing factor activity in cellular blood elements.[4,5,6] Specifically, platelet factor 4, a protein which neutralizes heparin activity is released from platelets during platelet aggregation and nucleotide release. In our patient, this mechanism is unlikely as he responded to the administration of fresh frozen plasma.

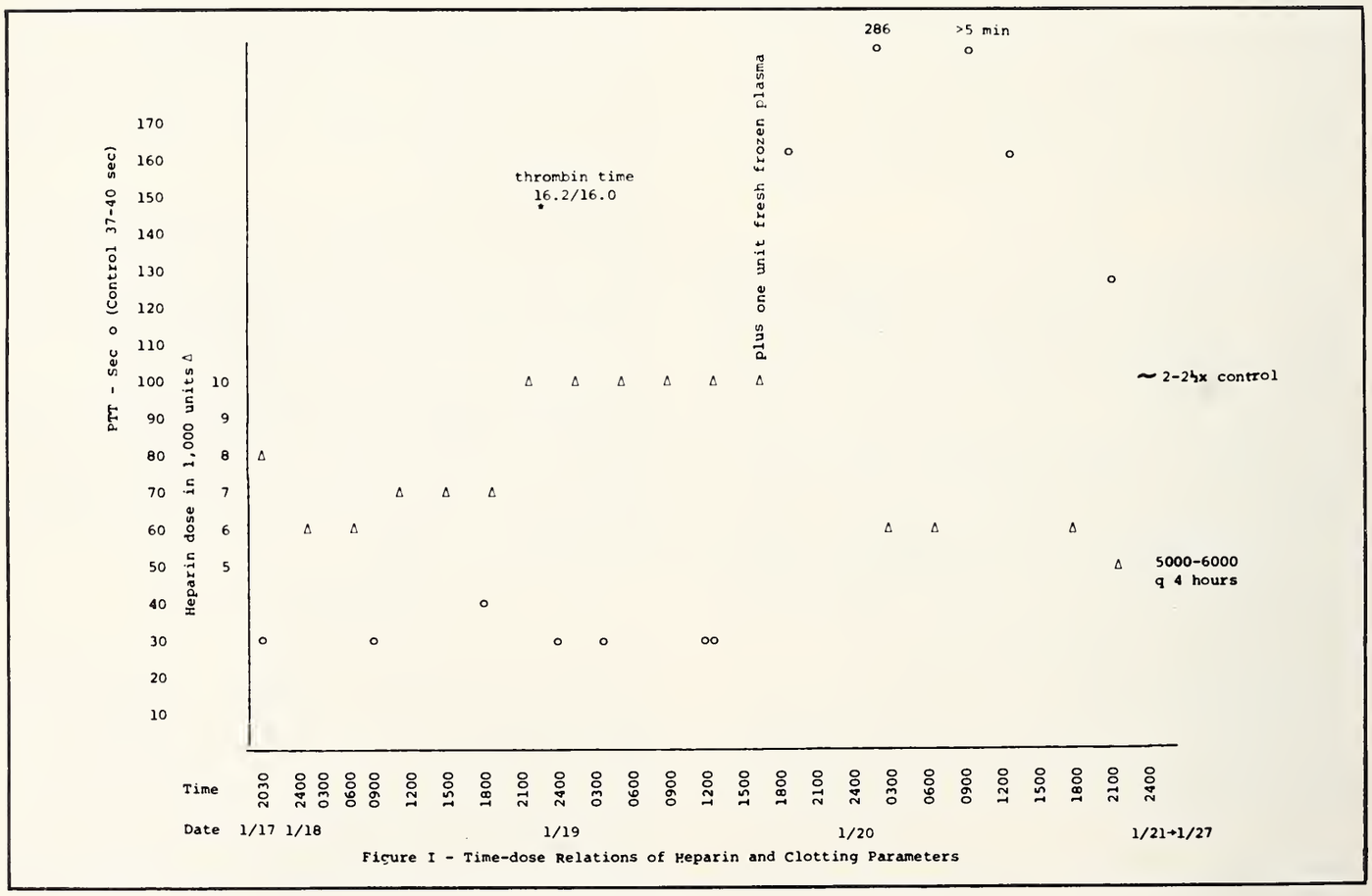
Antithrombin III, or heparin cofactor deficiency, has been recognized to cause heparin insensitivity, and a tendance towards thrombotic disease.[7,8,9] Antithrombin III carries most, if not all, the heparin cofactor activity of the blood.[10,11]

Antithrombin III is an Alpha-2 globulin with a molecular weight of about 63,000. It contains an arginine residue which reacts with the serine active center on the thrombin molecule. Thrombin is thus neutralized, preventing the formation of fibrin from fibrinogen. Antithrombin III is believed to react similarly with other serine proteases such as activated factors XII, XI, IX, X and plasmin. Thus, the coagulation process may be affected in several different places. Heparin in turn acts as a catalyst combining with the lysine groups of the antithrombin III. This causes a conformational change of the antithrombin III molecule resulting in a rapid acceleration of the antithrombin III action. Without antithrombin III, heparin has no significant anticoagulant action.[12,13]

Antithrombin III deficiency may be inherited as an autosomal dominant trait producing a tendency to thrombotic disease and pulmonary embolism,[7,8] The frequency of this deficiency is estimated to approach one per 2,000 in the Norwegian population as well as in the state of Massachusetts.[12]

Oral contraceptives have been shown to decrease antithrombin III levels in patients who had normal values prior to contraceptive administration.[14] Patients with atherosclerosis, as evidenced by a healed myocardial infarction or by intermittent claudication, have a decrease in serum antithrombin activity.[15] A similar decrease in antithrombin III exists in patients with coronary artery obstruction as demonstrated by arteriography.[1] Decreased levels of antithrombin III have been reported in patients who have active thrombophlebitis, pulmonary embolism and disseminated intravascular coagulation. The same study found that anticoagulant treatment has led to a rapid return to normal of the plasma antithrombin III level.[16]

Thus, the insensitivity to heparin in our patient may



Figure

have been due to profound depletion of antithrombin III during an active coagulation process, with restoration towards normal by the fresh frozen plasma infusion. The normal antithrombin III level during the coumadin therapy is consistent with the above reports. The decrease in antithrombin III levels when coumadin had been discontinued suggests that the patient has a congenital or acquired decrease in antithrombin III.

A person with this deficiency and clinical history should be considered for indefinite coumadin therapy.

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Minnesota Medical Auxiliary Day at the Capitol

February 22, 1978

At this writing, only four states are planning a Day At The Capitol this year. Our tentative schedule looks like this:

9:00 A.M.	Coffee/Registration
10:00 A.M.	Tour of Capitol
11:00 A.M.	Audience with the Governor, attend committee hearings
12:00 Noon	Social and Fellowship - Holiday Inn Luncheon - Holiday Inn
1:15 P.M.	Doctor Chester A. Anderson, President, Minnesota Medical Association - Welcome/Challenge
1:30 P.M.	Mr. Jim Sova, Director, Department of Legislation, Minnesota Medical Association - State Overview
2:00 P.M.	Senator Jerome Hughes, Chairman, Education Committee - Early Childhood
2:30 P.M.	Senator Nancy Brataas, Health, Welfare & Corrections Committee - Woman's perspective
3:00 P.M.	John Krichbaum, Legislative Department, Public Affairs Division, American Medical Association - National Scene

Yes, this is an ambitious program, but we in Minnesota are leaders in legislation because of our industriousness. We are particularly pleased with the good liaison and excellent communications between the medical association and the auxiliary. As partners, we can continue to promote good health care legislation in Minnesota. Because personal contact with our respective congresspeople is the key to favorable legislation, ample opportunity will be given to auxilians to personally invite their legislators to the above luncheon. The speakers will be of interest to all. Our legislative goal this year is to live up to the title of "provider" given doctors' wives by the Federal Government. Here's a beautiful chance. SO — barring a blizzard, we expect to see all spouses in St. Paul on George Washington's Birthday!!!!

Gayle Whitesell
State Legislative Chair

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"Possibly" effective: as adjunctive therapy in the treatment of peptic ulcer and in the treatment of the irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis.

Final classification of the less-than-effective indications requires further investigation.

Contraindications: Glaucoma; prostatic hypertrophy, benign bladder neck obstruction; hypersensitivity to chlordiazepoxide HCl and/or clidinium Br.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants, and against hazardous occupations requiring complete mental alertness (*e.g.*, operating machinery, driving). Physical and psychological dependence rarely reported on recommended doses, but use caution in administering Librium® (chlordiazepoxide HCl) to known addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions) reported following discontinuation of the drug.

Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy. Advise patients to discuss therapy if they intend to or do become pregnant.**

As with all anticholinergics, inhibition of lactation may occur.

Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude ataxia, oversedation, confusion (no more than 2 capsules/day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider pharmacology of agents, particularly potentiating drugs such as MAO inhibitors, phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions reported in psychiatric patients. Employ usual precautions in treating anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship not established.

Adverse Reactions: No side effects or manifestations not seen with either compound alone reported with Librax. When chlordiazepoxide HCl is used alone, drowsiness, ataxia, confusion may occur, especially in elderly and debilitated; avoidable in most cases by proper dosage adjustment, but also occasionally observed at lower dosage ranges. Syncope reported in a few instances. Also encountered: isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent, generally controlled with dosage reduction; changes in EEG patterns may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice, hepatic dysfunction reported occasionally with chlordiazepoxide HCl, making periodic blood counts and liver function tests advisable during protracted therapy. Adverse effects reported with Librax typical of anticholinergic agents, *i.e.*, dryness of mouth, blurring of vision, urinary hesitancy, constipation. Constipation has occurred most often when Librax therapy is combined with other spasmolytics and/or low residue diets.

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Description: Each sugar-coated tablet supplies 5 mEq. of elemental potassium (as potassium gluconate 1.17 Gm.). Kaon Tablets are sugar coated, not enteric coated, which favors dissolution in the stomach and absorption before reaching the small intestine where the lesions with enteric potassium chloride have occurred. The sugar coating merely adds to palatability and ease of swallowing, not to delay absorption as does the enteric coating.
Indications: Oral potassium therapy for the prevention and treatment of hypokalemia which may occur secondary to diuretic or corticosteroid administration. It may be used in the treatment of cardiac arrhythmias due to digitalis intoxication.
Contraindications: Severe renal impairment with oliguria or azotemia, untreated Addison's disease, adynamia episodica hereditaria, acute dehydration, heat cramps and hyperkalemia from any cause.
Warning: There have been several reports, published and unpublished, concerning nonspecific small-bowel lesions consisting of stenosis, with or without ulceration, associated with the administration of enteric-coated potassium tablets alone or when they are used with nonenteric-coated thiazides or certain other oral diuretics. These small-bowel lesions have caused obstruction, hemorrhage and perforation. Surgery was frequently required and deaths have occurred. Available information tends to implicate enteric-coated potassium salts, although lesions of this type also occur spontaneously. Therefore, coated potassium-containing formu lations should be administered only when indicated and should be discontinued immediately abdominal pain, distention, nausea, vomiting, or gastrointestinal bleeding occur. Coated potas sium tablets should be used only when adequate dietary supplementation is not practical.
Precautions: In response to a rise in the concer tration of body potassium, renal excretion of th ion is increased. With normal kidney function, it is difficult, therefore, to produce potassium intoxication by oral administration. However, potassium supplements must be administered with caution, since the amount of the deficienc or daily dosage is not accurately known. Frequent checks of the clinical status of the patient and periodic ECG and/or serum potassium levels should be made. High serum concentra-

Time is the test of all things



ons of potassium ion may cause death through ardiac depression, arrhythmias or arrest. This rug should be used with caution in the presence f cardiac disease.

In hypokalemic states, especially in patients n a salt-free diet, hypochloremic alkalosis is a ossibility that may require chloride as well as otassium supplementation. In these circum- ances, Kaon (potassium gluconate) should be upplemented with chloride. Ammonium chlo- de is an excellent source of chloride ion (18.7 Eq. per Gram), but it should not be used in atients with hepatic cirrhosis where ammonium alts are contraindicated. Other sources for loride are sodium chloride and Diluted ydrochloric Acid, U.S.P.

It should also be kept in mind that ammonium ycle cation exchange resin, sometimes used to eat hyperkalemia, should not be administered to patients with hepatic cirrhosis.

Adverse Reactions: Nausea, vomiting, diarrhea and abdominal discomfort have been reported. The symptoms and signs of potassium intoxication include paresthesias of the extremities, flaccid paralysis, listlessness, mental confusion, weakness and heaviness of the legs, fall in blood pressure, cardiac arrhythmias and heart block. Hyperkalemia may exhibit the following electrocardiographic abnormalities: disappearance of the P wave, widening and slurring of QRS complex, changes of the S-T segment, tall peaked T waves, etc.

Overdosage: Potassium intoxication may result from overdosage of potassium or from therapeutic dosage in conditions stated under "Contraindications." Hyperkalemia, when detected, must be treated immediately because lethal levels can be reached in a few hours.

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Precautions: See Kaon Tablets.

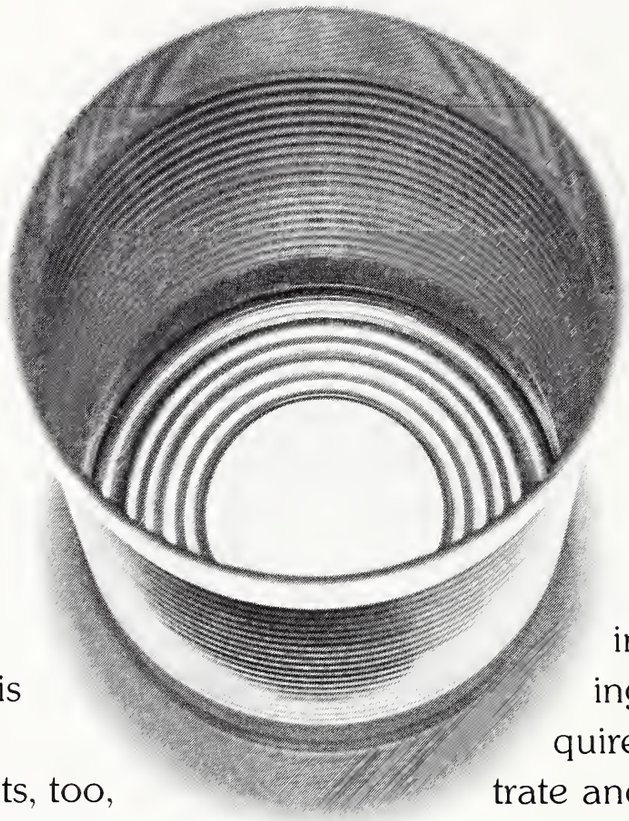
In hypochloremic alkalosis, potassium replacement with potassium chloride (e.g., Kaochlor® 10% Liquid) may be more advantageous than with other potassium salts.

Adverse Reactions: See Kaon Tablets.

Overdosage: See Kaon Tablets.

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Family Practice

Effect of Illness on the Family

JOHN VERBY, M.D.*

THE INDIVIDUAL presenting may not be "the patient". The patient may be the whole family unit, another member of the family, or it may be the family and the community. In over 250,000 patient encounters in my general practice in rural Minnesota, the family had marked effects on the patient and vice versa. Webster defines illness as an unhealthy condition of body or mind. Illnesses such as mental deficiency, leukemia, and bodily injury elicit a wide range of responses by other family members.

Mental Deficiency

No diagnosis is more family-centered than one which implies mental deficiency, so help is needed for the family as well as the handicapped individual. It seems easier for families to accept a firm clinical diagnosis of mongolism, cerebral palsy, psychiatric disorder, or even "poor educational potential" rather than one of "mental deficiency."[1] An early accurate prognosis is also desired by the family members.

Bodily Injury

Accidental injury is still the major cause of death in children over the age of one year. Accidents are the result of interaction between a child and his environment. Every accident should be viewed as a breakdown in the child's adjustment to his/her own environment; the most important part being the home and family and the individual members of the family! In one study of families involved,[2] housing was inadequate with crowding and no space to play. Physical and psychiatric illness in other family members was prevalent, and 29% of the parents were either divorced, separated, or unmarried and not cohabitating in a stable relationship.

Influence of Socioeconomic Status on Illness

Children of preschool nursery age (1½ to 6 years), from disorganized lower class families in the Boston area were studied and the developmental deviations of these children were different from those reported in the literature of other preschool children.[3]

A study of children in Boston[3] showed that there is a psycho-social continuum in which the characteristics of a slum, skid-row culture do influence their growth and development. This effect is mediated through the family, particularly the mother. By their behavior, the children and their families maintain this culture generation after generation.

Conflicting culture patterns within any one family unit such as different ethnic groups (Italian, Irish, Russian, Spanish, American Indian, etc.) are complicating factors in management and in child rearing. Psychosis and alcoholism are present in 1/3 of the family groups studied along with marital discord, separation, divorce, illegitimacy, marked deficiencies in nurturing, and anti-social behavior. The father often has a criminal record and the mother may be a prostitute. *The family appears to be a family of children, with the adult parents never being models of appropriate parenting or behaving as mother and father in supportative, nurturing roles to their children. Neglect, poverty, and constant rejection is the rule for all members of the family during their lifetime.*

Influence of Marital Breakdown on Illness

Chester [4] reports that health troubles spring from marriage breakdowns. Otterstrom[5] finds that compared to the general population figures, divorced fathers have twice the normal expectations for conviction of a felony and are somewhat more likely to be addicted to alcohol. A follow-up of the family offspring shows that both boys and girls are high risks for criminality and alcoholism. Mechanic[6] reports a tendency on the part of mothers under stress to report more illness symptomatology for themselves and for their children. Cartwright[7] finds discrepancies in the wives' estimate of their spouses' symptoms as compared to that of the husbands themselves. This is one of the numerous problems encountered in the familial study of family illness. Kosa[8] observes that the general health of the family is comprised of so many disparate events that the total recall or consistent recording over a specified period of time or in specified sequences has been almost impossible. As a result, such accounts are frequently subject to both quantitative and qualitative errors (number and length of illnesses), including under-reporting of actual events.

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Given at the International Kongress of General Medicine, Strafford on Avon, England, April 1976.

Alpert et al.[9] have estimated that the ratio of medical non-attended symptoms to medically-attended symptoms may be in the magnitude of seven to one. It is noted that the mother's educational status is found to play a more important role in the children's behavioral performance than the father's status. Families who are culturally and/or socio-economically disadvantaged are more likely than those who are not so disadvantaged, to have behaviorally retarded children.[10]

Role of the Mother

In a study of midwestern families, we find the wife-mother to be by far the major source of medication use within the family setting, considerably out-distancing other family members in this regard.[11] In view of her apparent inability and reluctance to assume the sick role when ill, due to the severe strain her prolonged incapacitation might have on the functioning of the family, it is hardly surprising that she should rely on such preventive and curative measures to sustain her and permit her to carry on her normal family role. She remains the central agent of cure and care within the family complex and also is the one to define, organize, and take action when her children have symptoms. Aday[12] finds mothers' attitudes and behavior to be especially relevant for explaining their children's different utilization of health and disease services. Mothers are more likely to seek medical care and advice for their children than for themselves and appear much more willing to accord their children the right to the sick role than themselves.[13] Litman notes that almost 75% of the younger generation's families endorse the notion that an ill family member has a right to expect care from his or her family.[14] The grandparents, those most likely to be recipients of such care, appeared to have the most misgivings about their doing so.

Family Dynamics

The impact of illness on family functioning reveals that within the family, the wife-mother (33%), especially in the married-child generation, followed by her husband (10.6%) and children, proves to be the family member most affected by the illness of the spouse and vice versa. The impact of their children's illnesses primarily centered on the wife-mother (55% vs 3% for her spouse). *Chronic or complex illnesses significantly affect the family members' role relations more than acute short-term illnesses.*

The impact of illness on the cohesive, well-integrated, happily married family can cause partial or severely strained relations among family members while those more disparate family ties are brought closer together. *Family member hospitalization brings the most disruptive effects on the activities of the wife-mother.*

Maternal mental illness causes children's arrests in language, gross motor, and personal-social skills. Their skills in self-feeding or toilet training do not emerge and they reveal a reluctance to accept new toys or explore new situations. They are inactive, sober, irritable, and tolerate minor stresses poorly. Separation from the mother produces intense anxiety reactions, and they have frequent temper tantrums. These children are encouraged to sleep long hours, and they remain silent since there is no response to their vocalizations.

In London, unappreciated disturbances were found in the families of children who died of burns.[15] To some parents, the burns appeared as war injuries and were considered as additional injuries *after* admission to the hospital. Visible injury increased anxiety in the parents. Parents felt useless and helpless in the presence of the specialized hospital staff and this caused them not to care about the child, with a number of parents never returning to visit their child. Parents revealed feelings of self-recrimination, guilt and feelings of persecution; often were unable to perceive or respond to the needs of their other children. Gross domestic disorganization led to critical attitudes in people outside the family. The relation between parents of dead children was strained for some months after the accident, often accompanied by a failure to talk to each other or to give each other mutual support. Angry feelings were expressed and an increased sense of isolation was noted. Relations with surviving children degenerated and time did little to soften the memories about the dead child. It is suggested that a medical social worker be committed to intensive care burn units to support the parents and other relatives in as urgent a manner as the resuscitation and other surgical treatment of the severely injured child.

Impetus to Seek Medical Care

Increased pressures on mothers reveal the tendency to be concerned with symptoms in their children and to seek release from role obligation and emphasize claims of illness in the children. Mothers perceiving life as stressful or experiencing dissatisfaction in their family relationships, not only report more personal illness but appear to recognize more illness in their children. The mother's use of medical services for her child is associated with her own inclinations to use such services along with her actual use of them. A visit to the family physician may result as much from the fact

that the mother feels harassed and unhappy as it does from the child's state of health or illness. Many of the problems presented go beyond simple physical symptomatology. They may involve various kinds of disruptions and difficulties in the mother's relationship to her child. It is important for the physician to look beyond the mother's presentation of the child's difficulties and consider in what ways the mother's state of health or her relationship to the child may play some part in the difficulty presented. It is often the mother's condition and her attitude which initiates a medical visit or a distressed call for the doctor and many problems having other than organic origins are presented as physical ones to avoid the implication that the mother has in some way failed in her responsibilities. The physician must often help the mother recognize her feelings in this regard.[16]

Familial Adaptations to Serious Illness

Bozeman et al.[17] investigated the adaptations of mothers whose children (ages 1½ to 6½ years) were dying of leukemia and found that all mothers were unable to express their reactions in terms other than descriptions of physical injury to themselves. The manner of diagnosing by the physician, through giving the mother hope and involving oneself in participation in the planning for treatment of the child, helped to modify the severity of the mother's symptoms All mothers initially attempted to deny the implications of the diagnosis by screening out hopelessness of the prognosis or by frantic attempts to disprove the accuracy of the diagnosis through consultation and hospitalizations with other physicians. None of the mothers attempted to deny the illness itself. Many of the mothers expressed guilt and assumed personal responsibility for their children's illness. Separation anxiety was experienced by every mother at the initial hospitalization of the child. Its intensity varied with the child's meaning in her life. The mothers used coping resources and expressed needs for transportation and housekeeping, emotional support to bolster functioning for herself, and temporary escape from the oppressive awareness of the illness and approaching loss. Generally, maternal grandmothers were unsupportive so the mothers turned to their friends and neighbors for support and comfort.

In serious organic illness, family members often become extremely anxious, insecure, and depressed, and the *need for support* to the mother and family is great. When a leukemic child dies, in only one-third of the families does any member of the primary care team become involved in the family bereavement. Some doctors will make special arrangements to see the mother of the family once a week. Occasionally a number of these mothers may subsequently need hospital admission for depression.[18] Time, dialogue, and ventilation are essential.

Timely Intervention

Haggerty[19] and Miller reiterate the illness patterns of the children in a Newcastle study of 1,000 families by stating: "...diseases fell in new and more relevant groups when illness was seen in the family context." The knowledge of the family leads to better medical care for the child and is the principal reason why a physician needs to understand the family of one's patients. Caplan[20] holds that family crises such as births, deaths, marriage, job changes, family quarrels, separation, divorce, illness and accidents are appropriate and most effective times for health personnel to help a family develop more healthy patterns of life. Alpert et al.[21] in a study of lower middle class urban U.S.A. citizens, say that the mother diagnosed and managed the majority (62%) of all episodes of ill health in her children.

Illness Begats Illness in a Family Setting

Meyer[22] found that a family member who became ill with Streptococcal infection was four times more likely to have experienced a severe family crisis, e.g., death of a close relative, birth of a sibling, or marital upset in the two-week period preceding than in the two-week period following the illness.

Clyne,[23] reviewing night calls by general practitioners in England, found nearly half of the night call requests to see a child were in reality requests of help for an adult who was more in need. Thus, the child's illness or symptom may be a family's conscious or unconscious way of seeking help for a problem which they are unable to ask directly.

The Holmes and Rahe social readjustment scale helps me to understand the effect of family lifestyle changes on the predictor of general illness or disability in the individual members of the family. The scale rates death of spouse as 100. Forty-three common life changes in the order in which they have been found to be precursors of illness are listed on the scale as: divorce, 73; pregnancy, 40; death of a close friend, 37; child leaving home, 29; outstanding personal achievement, 28; change in residence, 20; etc. If in one year's time your score is between 150 and 300, you have a 51% chance of becoming ill. A total of 300 points or more means one is in real danger, for the odds are 80% that one will become ill. The illness will

probably be cancer, a heart attack, or manic-depressive psychosis—not skin warts or menstrual irregularities. The results appear to have little to do with culture and are the same for civilians and Navy men in the U.S., Japan, El Salvador, Spain, Belgium, Sweden, Denmark, and Finland.[24]

As a family physician, this helps me to understand and care for patients and families (and myself and my family). The effect of illness and lifestyle changes on other members of the family now becomes more obvious, particularly the psycho-social variables that manifest in biological disease. Lest we minimize the stress and strain and psycho-social variables affecting the family, there are some distinct effects on the psycho-social characteristics of children from a developmental viewpoint.

Health Care Directed at the Whole Family

Generally, *local care* by myself and health visitors had the advantage of minimizing interruption of schooling and family life, lowering traveling costs to regional tertiary care hospitals, and maximizing personal contact between patient, family and myself. Limited but truthful statements, accompanied by hope and an expression of sympathetic support, seem the most valuable prescription a doctor can offer. It improves the team concept of care and there is greater gratitude on the part of family members. Family and patient compliance are enhanced by the communication to key hospital personnel of the importance of giving necessary encouragement to the local community support services, the patient, and the family.[25]

In my home town community of Saint Paul, Minnesota, a survey of 108 public and private agencies showed that 6 percent of all the families absorbed 46 percent of the health services and 55 percent of all the adjustment services, including psychiatric service, casework, and protective supervision.[26] If we address ourselves to the problems of this 6 percent of all the families that absorb the majority of the helping services, we'll have done a real service to the community.

Serious illness often precipitates a crisis within the family. Holt[27] described the social disorganization that occurs in a family whose child had cerebral palsy. In 40% of these families, parents never went out together after diagnosis of the illness of the affected child, and 74% of these families were socially isolated from their neighbors. Established roles and rules must change to meet the crisis, and the family needs to reorganize to gain a new equilibrium. The way in which they carry out this process can dramatically affect the sick person and the outcome of the illness. At times the reorganization can be disruptive, functionally and emotionally, to other family members.[28]

By recognizing a cluster of developmental aberrations in a child and looking more closely at maternal and child-rearing characteristics, the physician may diagnose maternal depression as the cause of the child's slow development and direct appropriately the focus of one's intervention from child to mother in the best interests of both.[29]

To solve the problems of illness-prone, disorganized families requires sustained mobilization of community resources. Cooperation among various disciplines is essential. At present, little of our knowledge and professional efforts have been used to focus on these families. They represent one of the biggest challenges facing the medical profession. The family physician and helping professionals can be the key people to support, guide and help these families in the prevention of serious illnesses among family members. This is part of what family practice is all about.

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Fracture Conference

Stress Fractures

BERNARD F. MORREY, M.D.,* EDWARD M. FITZGERALD, M.D.,* and KENNETH A JOHNSON, M.D.†

Dr. Bernard F. Morrey:

Fatigue or stress fractures generally are seen in the young military recruit. However, they are not uncommon in a civilian practice. It is important to distinguish these fractures from more serious entities and to appreciate the various types of fatigue fractures and their appropriate managements.

Case Reports

Case 1

A 37-year-old farmer was initially seen with a five-week history of pain at the lateral aspect of his left foot. He had a 30° anterior and 30° varus deformity of his left distal tibia and fibula from malunion of a fracture sustained five years previously.

Dr. Timothy C. Fitzgibbons:

The roentgenograms show a fracture of the shaft of the fifth metatarsal (Figure 1).

Dr. Morrey:

Is this a common site for a stress fracture?

Dr. Fitzgibbons:

No, the second and third metatarsals are more common sites.

Dr. Morrey:

I agree. Experimental data suggest that the second and third metatarsals may be the strongest of the metatarsals yet they are the most common sites of stress fracture in the foot. This particular fracture was seen in an uncommon site on the lateral side of the foot and probably occurred because of an abnormal gait secondary to the malunited tibial fracture. How would you treat this fracture?

Dr. Fitzgibbons:

It could be treated symptomatically by a reduction in activity or by a short leg cast.

Dr. Morrey:

Reduction in activity was recommended, as well as future realignment of the malunion, in order to avoid further stress on the lateral aspect of the foot.

Case 2

A 20-year-old man experienced pain in his foot. For approximately two months, the pain had been increasing; there was no preceding traumatic episode. He had persistent swelling and tenderness.

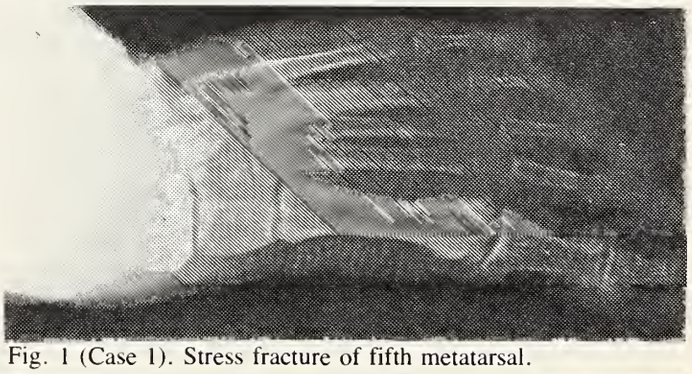


Fig. 1 (Case 1). Stress fracture of fifth metatarsal.



Fig. 2 (Case 2). Destructive lesion of shaft of second metatarsal.

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Fracture Conference, September 17, 1975.

Dr. John D. Bloom:

The roentgenogram (Figure 2) shows that the second metatarsal is deformed, with a great deal of periosteal reaction. This looks more like a destructive process than a simple stress fracture. These roentgenographic features should make one suspect a neoplastic process or osteomyelitis.

Dr. Morrey:

Your interpretations are correct, and biopsy revealed Ewing's sarcoma.

Case 3

A 60-year-old man had a two-month history of pain in his calcaneus. He had no other symptoms and did not have a history of trauma.

Dr. Donald P. Braun:

The roentgenogram (Figure 3) shows an area of sclerosis at an oblique angle through the midportion of the calcaneus. Was an axial view or a tomogram of this area obtained?

Dr. Morrey:

No, the diagnosis was made from the lateral view. In the calcaneus, stress fractures do not appear as a fracture line but rather appear as an area of sclerosis, representing fracture healing. The fracture typically occurs obliquely across the posterior aspect of the bone. In a large military series, this type was the second most common fatigue fracture, but in a civilian population, it is rare. How would you treat this fracture?

Dr. Braun:

I would suggest symptomatic treatment only, with a short leg cast or protected ambulation.

Dr. Morrey:

Because this fracture does not displace, treatment is not difficult. Plastic heel cups or foam rubber heel pads also are effective in relieving pain during ambulation. This type of fracture probably occurs much more frequently than is recognized, but because the patient limits his activity, the pain subsides and the condition is not brought to the attention of the physician. What is the differential diagnosis?

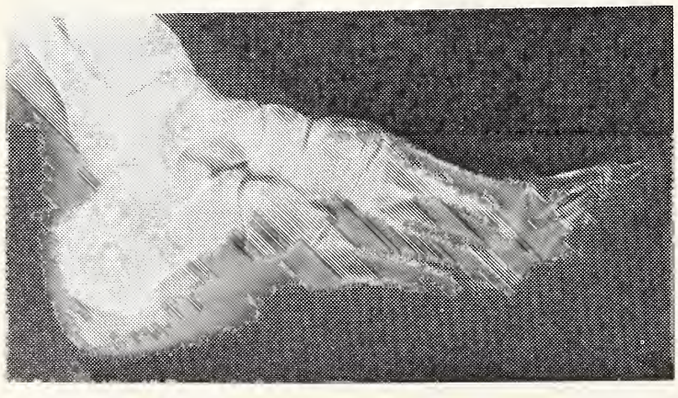


Fig. 3 (Case 3). Typical appearance and location of fatigue fracture of calcaneus.

Dr. Braun:

Achilles tendon rupture or bursitis might be considered as possible sources of pain in this area. A careful examination, precise localization of the pain, and recognition of the typical features of the roentgenogram should help in the differential diagnosis.

Case 4

Dr. Morrey:

A 16-year-old girl, a member of her high school track team, was seen initially because of pain and swelling in the vicinity of her lateral malleolus. The pain had been present approximately six weeks.

Dr. Thomas C. Shives:

The roentgenograms (Figures 4 (A) and (B)) show a fracture of the distal end of the fibula, and there may be a little periosteal reaction on the proximal fragment.

Dr. Morrey:

How would you treat this fatigue fracture?

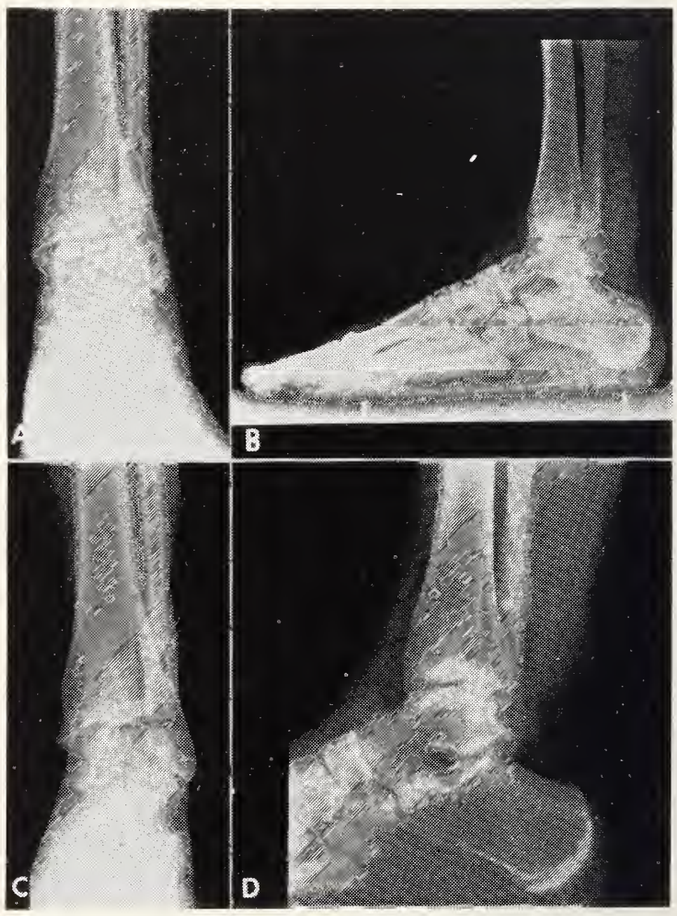


Fig. 4 (Case 4). (A) and (B), Stress fracture proximal to lateral malleolus, a typical location. (C) and (D), Nine weeks later, fracture was painless, but fracture line is clearly visible without evidence of significant healing.

Dr. Shives:

I would treat it symptomatically, with crutches or a short leg walking cast.

Dr. Morrey:

The patient was placed in a short leg walking cast, which was removed in six weeks. Roentgenograms were taken at nine weeks (Figures 4 (C) and (D).

Dr. Shives:

Some callus seems to be forming, although the fracture line is still evident.

Dr. Morrey:

The natural history of this fracture is uneventful healing, even without specific treatment, because pain tends to limit the patient's activities. The fracture line, however, may persist for months.

Case 5

A 16-year-old high school football player had a 10-day history of limp and a painful left leg without specific trauma.

Dr. Frank C. Hui:

The roentgenograms (Figure 5) show some periosteal reaction and sclerosis of the proximal tibia, but no definite fracture line.

Dr. Morrey:

What would the differential diagnosis be in this situation—that of a 16-year-old boy without a history of trauma and without systemic signs?



Fig. 5 (Case 5). Ill-defined sclerotic lesion of proximal tibia.

Dr. Hui:

I believe that low-grade osteomyelitis, neoplasm, and stress fracture should be considered.

Dr. Morrey:

How would you resolve the issue?

Dr. Hui:

Initially, a sedimentation rate should help—a high value would suggest inflammation—and tomography would define the lesion better.

Dr. Morrey:

Although both of these tests may be helpful, the sedimentation rate also can be mildly elevated in a fatigue fracture.

Dr. Mark B. Coventry:

The anteroposterior roentgenogram shows sclerosis that is not periosteal but which crosses the diameter of the bone. This is not usually seen in tumor and is a little subtle sign that makes you much more confident that this is a stress fracture.

Dr. Morrey:

This roentgenographic feature was appreciated by the reviewing physician, and the patient was treated symptomatically and the symptoms resolved. In a very rare instance, this fracture may displace, but this will not occur if activities are limited until the pain subsides.

Dr. Anthony J. Bianco, Jr.:

One other feature that might sometimes help is that stress fractures in young children almost always occur in the posterior aspect of the proximal tibia and not anteriorly.

Case 6

Dr. Morrey:

A 51-year-old man fell and sustained a bimalleolar fracture. The medial malleolus failed to unite and was internally fixed eight months after the initial fracture. Consequently, the patient was on crutches for a greater part of a year, and shortly after ambulation with full weight-bearing, pain developed in the ipsilateral hip; and this roentgenogram was taken (Figure 6). Dr. Gavigan, how would you treat this fracture?

Dr. William M. Gavigan:

These types of fractures all have to be treated with internal fixation because they have a significant chance of displacement and are associated with a high incidence of nonunion.

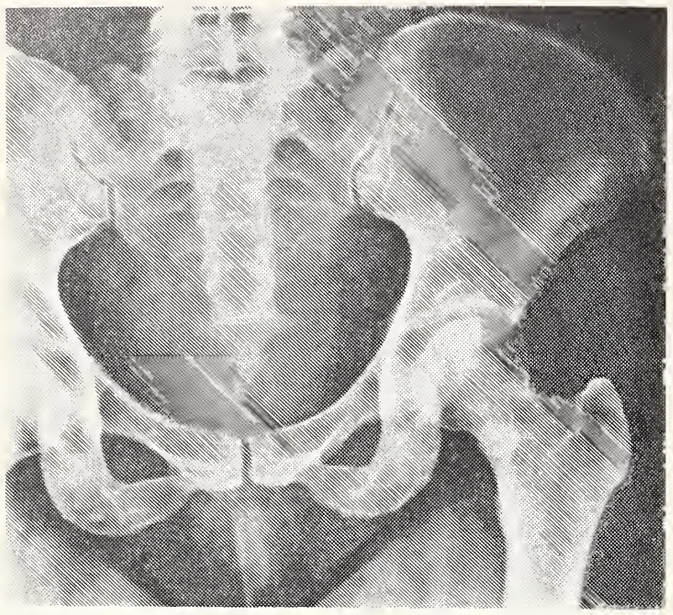


Fig. 6 (Case 6). Fatigue fracture of femoral neck.

Dr. Kenneth A. Johnson:

The roentgenographic distinction of fatigue fractures presenting as lines of condensation rather than rarefaction may be important. If the fatigue fracture presents as a sclerotic line that only partially crosses the femoral neck, I believe that the patient may be managed nonoperatively with protected weight-bearing and observation until the fracture heals.

Dr. Morrey:

Because this fracture presented as a line of rarefaction, and because of the poor prognosis associated with displaced fatigue fractures of the femoral neck, the fracture was internally fixed.[1,2] Dr. Fitzgerald has reviewed the subject of fatigue fractures, with special reference to fractures that require internal fixation.

Comment

Dr. Edward M. Fitzgerald:

A fatigue or stress fracture occurs in a bone subjected to repeated stress or trauma. Each individual episode may be inadequate to cause a fracture, but because of the repetitive nature, bony disruption occurs.

A biomechanical paradox is presented by fatigue fractures: Bone is a material that usually fails in tension, but fatigue fractures often occur in areas that are subjected to compressive stresses. Many surgeons advocate compression to promote fracture healing, yet in fatigue fracture, compression apparently aggravates the process.

Most fatigue fractures occur in military recruits between the ages of 18 and 25 years, but such fractures also occur in the teen-age athlete and the weekend sportsman.[3] Fatigue fractures have been noted in patients whose ages have ranged from 15 months to 70 years or older, if fractures of the femoral neck are included.[1]

The patient usually complains of pain with activity, and often he will be engaged in more vigorous activity than he is ordinarily accustomed. In one series, the metatarsal and calcaneus represented 82% of fatigue fractures of the lower extremity,[4] and less commonly, the tibia was involved (13%). Less than 5% of the fractures occur in the femur, but fractures of the femoral neck can be disastrous. Consequently, this fracture is one of the most important to diagnose.

The examination reveals local tenderness and swelling. The early roentgenograms are not always helpful. In fact, in calcaneal fractures, 95% of the patients will have negative roentgenographic findings on the first examination, and sometimes the fracture does not become roentgenographically apparent for as long as one month.[5] The roentgenogram will demonstrate one of four types of appearances: a line of lucency, a periosteal elevation, a sclerotic band, or a fragmentation at the fracture site.[6] Hence, the diagnosis of fatigue fracture cannot always be made roentgenographically, but often is made clinically. More thorough evaluation is sometimes necessary to exclude malignancy or osteomyelitis. Because a fatigue fracture is a dynamic process of bone breakdown and repair, the usual treatment consists simply of removing the stress and protecting the involved bone, thus allowing the fracture to heal.[7]

Most fatigue fractures are associated with a good prognosis, perhaps because many occur in the metatarsal and the os calcis,[4] and these heal simply by reducing activity. Fractures with a poor prognosis are those that do not heal and those that displace. Most of these occur on the tension side of a long bone.

Fatigue fractures in the tibia, occurring on the anteromedial cortex, heal slowly or may displace. Burrows[8] reported five ballet dancers with such fractures, and in one the fracture had displaced. One year was needed before any of the five patients returned to ballet dancing. Friedenberg[9] reported two men, 16 and 19 years of age, with fatigue fractures of the tibia that caused pain and limited activity for three to five years. Biopsy showed fibrous granulation tissue such as seen in a nonunion. The usual fatigue fracture of the tibia occurs on the posteromedial aspect at the junction of the medullary canal and the cancellous bone and usually demonstrates roentgenographic evidence of periosteal elevation. The process must not be confused with Ewing's tumor or osteogenic sarcoma.

Fatigue fractures of the femoral shaft are of three

types: linear, spiral, and transverse. Linear fractures heal with conservative treatment such as nonweight-bearing. Displaced spiral fractures may be prevented by early diagnosis and crutch walking. Transverse fractures occur in the distal femur and, according to Provost and Morris,[10] frequently (11 of 20 patients) displace. Displaced fatigue fractures should be treated as any other such fracture because they heal in the same manner as do acute closed femoral shaft fractures.

Patients with fatigue fractures of the femoral neck[7] have a poor prognosis. Devas[1] reported 35 fractures of the femoral neck, but many of them were pathologic fractures. He categorized them into compression and transverse fractures. None of the compression type displaced. Of the transverse type, 11 of 18 displaced and 7 of the 11 required endoprostheses. In a military series, Morris and Blickenstaff[3] correlated the fracture appearance with the patient's return to duty. They found that if no fracture line was apparent on the roentgenogram and that only sclerosis was seen on the compression side of the femoral neck, nine weeks were required for the patient to become symptom-free and return to duty. However, if a line of rarefaction was present at the calcar, 12 weeks were required before the patient returned to duty; and some of these patients required internal fixation. In their series, all nine patients with displaced fractures were treated by internal fixation, usually with multiple pins, and seven of the nine patients had poor results; six patients had to be dismissed from the service with medical disability. If a fatigue fracture of the femoral neck displaces, the consequences often are disastrous. Hence, if a fracture line occurs on the lateral tension side of the femoral neck, internal fixation should be done in order to avoid displacement.

Conclusion

Fatigue fractures often occur in a patient who complains of bone pain after subjecting the part to repetitive stress with inadequate conditioning. The diagnosis is often clinical, and the roentgenograms may show no abnormality. Treatment is usually symptomatic. If the long bones of the lower extremity are involved, delayed union or displacement may occur. The worst prognosis is associated with a displaced fracture of the femoral neck. In selected situations, internal fixation before displacement is the recommended treatment.

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Characteristics Common to Cutaneous Infections with Mycobacterium Marinum — Bauer et al. (page 75)

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ANCEF® is effective in post-surgical infections*

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- High Levels Present in Tissues and Fluids†
Ancef® achieves high concentrations in bone, synovial fluid, skin and soft tissues (such as pleural fluid, peritoneal fluid and lymph nodes). Ancef® is also excreted in a microbiologically active form in urine.

- High and Prolonged Serum Levels
A single 1 gram IV injection produced a mean peak concentration of Ancef® of 190 mcg/ml in healthy adult volunteers. After 4 hours, levels of 16.5 mcg/ml were still present.

- IM or IV Dosage Flexibility
The same dosage schedule can be used for both IM and IV administration.

- Well Tolerated
Most frequently reported adverse reaction is pain on injection. Please see next page for a complete list of reported adverse reactions. **Use with caution in patients with penicillin or other allergies.**

Please see next page for a brief summary of prescribing information, including indications, contraindications, warnings, precautions, and adverse reactions.

†Data on file, SK&F Medical Department. Tissue penetration is regarded as essential to therapeutic efficacy, but specific antibiotic tissue levels have not been directly correlated with specific therapeutic effects.

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CEFAZOLIN SODIUM

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Injection: 250 mg, 500 mg, and 1 gram vials

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Injection: 250 mg, 500 mg, and 1 gram vials

Most infections can be treated with 500 mg. or 1 gram of 'Ancef' every 8 hours.

Before prescribing, see complete prescribing information in SK&F literature or *PDR*. The following is a brief summary.

Indications: Ancef® (sterile cefazolin sodium, SK&F) is indicated in the treatment of the following serious infections due to susceptible organisms.

Respiratory tract infections due to *Streptococcus (Diplococcus) pneumoniae, Klebsiella* species, *Hemophilus influenzae, Staphylococcus aureus* (penicillin-sensitive and penicillin-resistant), and group A beta-hemolytic streptococci.

Injectable benzathine penicillin is considered to be the drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever.

'Ancef' is effective in the eradication of streptococci from the nasopharynx; however, data establishing the efficacy of 'Ancef' in the subsequent prevention of rheumatic fever are not available at present.

Genitourinary tract infections due to *Escherichia coli, Proteus mirabilis, Klebsiella* species, and some strains of enterobacter and enterococci.

Skin and soft-tissue infections due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci and other strains of streptococci.

Bone and joint infections due to *S. aureus.*

Septicemia due to *Str. pneumoniae, S. aureus* (penicillin-sensitive and penicillin-resistant), *P. mirabilis, E. coli,* and *Klebsiella* species.

Endocarditis due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci.

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to 'Ancef'.

Contraindications: 'Ancef' is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: BEFORE CEFAZOLIN THERAPY IS INSTITUTED, CAREFUL INQUIRY SHOULD BE MADE CONCERNING PREVIOUS HYPERSENSITIVITY REACTIONS TO CEPHALOSPORINS AND PENICILLIN. CEPHALOSPORIN C DERIVATIVES SHOULD BE GIVEN CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS.

SERIOUS ACUTE HYPERSENSITIVITY REACTIONS MAY REQUIRE EPINEPHRINE AND OTHER EMERGENCY MEASURES.

There is some clinical and laboratory evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both drugs.

Antibiotics, including 'Ancef', should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Usage in Pregnancy—Safety of this product for use during pregnancy has not been established.

Usage in Infants—Safety for use in prematures and infants under one month of age has not been established.

Precautions: Prolonged use of 'Ancef' may result in the overgrowth of nonsusceptible organisms. Careful clinical observation of the patient is essential.

When 'Ancef' is administered to adults or children with low urinary output because of impaired renal function, lower daily dosage is required (see dosage instructions in the package literature).

A false-positive reaction for glucose in the urine may occur with Clinitest® tablets; use glucose enzyme-type reagents.

Adverse Reactions: The following reactions have been reported: Drug fever, skin rash, vulvar pruritus, eosinophilia, neutropenia, leukopenia, thrombocythemia, and positive direct and indirect Coombs tests have occurred. Transient rise in SGOT, SGPT, BUN, and alkaline phosphatase levels has been observed without clinical evidence of renal or hepatic impairment. Nausea, anorexia, vomiting, diarrhea, and oral candidiasis (oral thrush) have been reported. Pain at the site of injection after intramuscular administration has occurred, some with induration. Phlebitis at the site of injection has been noted. Other reactions have included genital and anal pruritus, genital moniliasis, and vaginitis.

Administration and Dosage: 'Ancef' may be administered intramuscularly or intravenously after reconstitution. See the package literature for reconstitution procedures.

See the package literature for dosage recommendations.

How Supplied: 'Ancef' (sterile cefazolin sodium, SK&F)—supplied in vials equivalent to 250 mg., 500 mg. or 1 gram of cefazolin; in "Piggyback" Vials for intravenous admixture equivalent to 500 mg. or 1 gram of cefazolin; and in Pharmacy Bulk Vials equivalent to 5 grams or 10 grams of cefazolin.

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Continuing Medical Education

Q and A — CME

Questions from Minnesota Physicians Concerning Continuing Medical Education may be Addressed to:

MMA Committee on Medical Education
Suite 900
101 East 5th Street
St. Paul, MN 55101

Those answered in MINNESOTA MEDICINE are the most common or the most appropriate to a specific time. Queries from individuals will be answered as rapidly as possible only if a self-addressed stamped envelope is enclosed.

Q. "Does MMA now have a CME requirement?"

A. No. However, CME reports for the three-year period 1974-1976 are now ***past due.*** *Names of physician members not complying with that requirement will be submitted to the Judicial Committee of the MMA for action.*

Q. "Is there a new CME requirement for physicians in Minnesota?"

A. Yes. The Minnesota State Board of Medical Examiners is authorized by law to require satisfactory reporting of CME as one requirement of license reregistration. Physicians are advised to keep a personal record of all CME activities starting 1 January 1978. A report to the Board will be required later.

Q. "Where do I learn more about the new Minnesota CME rules?"

A. The State Board plans an informational mailing to all licensed physicians during early 1978 to acquaint them with the regulation. MINNESOTA MEDICINE *will have a question and answer page as often as necessary to assist physicians in their understanding of this new process.*

Q. "I don't think I can get all those hours in my area — there's no medical school or big hospital — I try to keep up, but ——?"

A. The State Board requirements seem more applicable to our Minnesota type of practice than the requirements of some national groups. There are many accredited general and specialty societies meeting regularly in the State. There are more and more hospitals within the State accredited for presenting qualifying educational programs. Participation in some of these activities each year, together with personal study, hospital scientific meetings and other self-improvements should add up quickly.

Q. "If I fulfill the CME requirements of my specialty society, will this satisfy the CME requirements of the State Board of Medical Examiners?"

A. Not necessarily. Although the CME rules state "The Board may accept certification of other state or national medical groups whose continuing medical education requirements are the equivalent or greater —", physicians should maintain accurate documentation of CME for submission to the Board. A list similar to that submitted to your specialty society probably will be acceptable.

Q. "Is AMA-LCCME Category I CME credit superceded by Minnesota State Board Category I credit?"

A. No. Category I credits for the voluntary Physician Recognition Award (PRA) of the AMA are allowed only for programs or presentations meeting certain criteria. These include planning, sponsorship or co-sponsorship of the educational activity by a LCCME accredited organization. Category I credit will probably be granted by the State Board for these activities. However, the Board may approve other CME programs that are clearly of value to physicians as satisfying the ***Board's*** *definition of Category I CME.*

Q. "What is the Minnesota Medical Association doing to help members achieve sufficient CME hours?"

A. MMA, through its Department of CME and Program Services and Committee on Medical Education, offers help to Minnesota physicians in locating and understanding their personal CME needs. The Annual Scientific Assembly of the MMA (May 11-12, 1978) will present an outstanding educational program in Duluth meriting Category I for the AMA-PRA, or prescribed credit for the AAFP and also satisfying the published rules for Category I credit of the State Board. Additionally, the MMA Committee on Medical Education is surveying for LCCME accreditation Minnesota hospitals that have the educational capability to offer Category I CME. The MMA's 1974-1976 CME reporting program has already made members alert to some of the details of types and availability of medical education and its reporting.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

Continuing Medical Education

Children's Hospital, St. Paul and Children's Health Center, Minneapolis

Pediatric Seminar — "Management of Diabetes Mellitus in Children." Saturday, February 25, Children's Hospital, 311 Pleasant Avenue, St. Paul 55102. 8:00 a.m. to 12:30 p.m.

Fee: $15.00 registration

3½ hours prescribed credit from AAFP

Contact: Krishna M. Saxena, M.D., Children's Hospital, 311 Pleasant Avenue, St. Paul, 55102.

University of Minnesota

Practical Ophthalmology in Primary Care — February 9-10, 1978.
Sugar Hills Resort, Grand Rapids, Minnesota

FEE: $110.00 (lodging not included)

Care of the Terminally Ill: Oncology Principles in Practice — February 17, 1978.
Bethesda Lutheran Medical Center, 559 Capitol Boulevard, St. Paul, Minnesota

FEE: $50 (Physicians) $25 (Allied Health Personnel)

The program will provide authoritative, practical answers to oncology principles in practice.

Practical Otolaryngology Update 1978 — February 20-21, 1978.
L'hotel Sofitel, 5601 West 78th Street, Bloomington, Minnesota

FEE: $125

This annual review course provides a variety of educational experiences in managing a broad range of common conditions.

Memorial



Donald W. Hastings, M.D.

On Sunday, September 4, 1977, Don and Jane Hastings were to leave Minneapolis for a European vacation. Good neighbor that he was, and unwilling to leave the grass of his East River Road home to grow to hay, he set out to mow the lawn on Saturday. While at his chore he complained of feeling ill. He was taken to nearby University Hospital and admitted to the Cardiac Intensive Care Unit. On the following day he died of a massive coronary occlusion.

Donald W. Hastings was born in 1910 in Madison, Wisconsin in the family of a business executive. He grew to manhood in that city and attended both college and medical school at the University of Wisconsin, graduating with honors in 1934. Internship at the Philadelphia General Hospital followed. The story around the University was that he was headed for a career in internal medicine, but apparently he developed an interest in psychiatry during that internship. Following his service, he was appointed a Rockefeller Fellow in Psychiatry at the Philadelphia Hospital for Nervous and Mental Diseases, where he served for two years. A third residency year was done at Harvard University, from which he returned to Philadelphia in 1939, to remain until 1942. During this time he was appointed Clinical Director of the hospital in which he had served his residency. He was also Associate Professor of Psychiatry at Woman's Medical College, and Associate at the University of Pennsylvania and at Jefferson Medical College. It was during this period that he came to know many of the young psychiatrists who were to carve out auspicious careers for themselves in the military during World War II and in academia during the postwar years.

It was now also that he courted Jane Wenban, the lovely woman who was to be his wife. Together they built a marriage which was to serve as an inspiration of love and tenderness. They became the parents of Donald W. Hastings, Jr., Jane Hastings Silver, and Mary Hastings. Their home was filled with music, books and laughter. There was in this family an unusual hospitality that offered comfort to the great and lowly, for their guests ranged from interns and first year residents to prominent leaders in academic, social and political life.

In 1942 Dr. Hastings responded to the call of his time and entered the Army. He was ordered to Randolph Field, Texas for training as a flight surgeon, and following that to England to join the Eighth Air Force.

Little need be said of that fabled outfit, which by its daylight bombing operations established the heavy bomber as a major weapon of World War II. Much, however, can be said of Dr. Hastings' effort, for he became Chief Psychiatrist of the Eighth Air Force and a major influence in the treatment of the many casualties. The use of heavy bombers in daylight operations over Germany was costly, for until the German Air Force was finally defeated, its casualties were enormous. His influence and contribution to the rehabilitation of the many psychiatric casualties which resulted were remarkable.

In 1944 he returned to become Chief Psychiatrist of the Army Air Force, and in 1945 returned to the Institute of the Pennsylvania Hospital.

In 1946 Dr. Hastings was recruited to the University of Minnesota to become Professor and Head of the Department of Psychiatry, a fortunate occurrence for many of us who came under his influence as students, and later as colleagues. He held this post with distinction until his death. During his tenure as Head of the Department, he revitalized the undergraduate teaching of psychiatry in the medical school; he recruited many a splendid teacher; he revitalized the graduate teaching program and he inaugurated an impressive program of research.

During the years following his tenure as Head of the Department of Psychiatry, he served for two years as elected Chief of Staff at the University Hospital, where his courage and strength, coupled with his unflappable serenity, gave him the ability to act as the oil which often calmed troubled waters.

Dr. Hastings was a teacher of patience and kindness. At the same time, he was firm in his insistence on basic knowledge. His personal adherence to staunch ethical and moral principles in the practice of medicine was central to his view of the art. His attitude on these matters served as an example to his many students. He was a consultant who could and did rescue fellow physicians from many a difficult diagnostic and treatment dilemma. Most of all, he was a doctor's doctor. In this Midwest there is many a physician who consulted him in time of trouble and came away strengthened from his strength, and calmed from his calm.

A poignant memory for many is the joy he took in conviviality with friends Sitting around a table with a bottle of scotch and a group of colleagues, he could engage in enjoyable repartee with the best. He was a spinner of yarns. One memorable one has to do with his search during Eighth Air Force days for appropriate rest havens for the battered crews of his B17s and B24s. One Friday evening he and a team of Air Force physicians, while visiting old castles and manor houses throughout the British Isles in search of such rehabilitation facilities, happened to arrive at the very spot that had been chosen by Winston Churchill for a weekend retreat. His description of the yarning and mutual exchange of stories with the Prime Minister is one which will never be forgotten by those who were privileged to hear it.

Don Hastings' scholarship was broad and catholic. He knew personally many of the pioneers in modern psychiatric research and was intimately familiar with their efforts. He was an outdoorsman who valiantly pursued deer in season, but always with a bow and arrow. There is no official record of his success in these efforts, but there is ample record of the joy he took in these outdoor excursions. He knew more about the early French explorers, the rivers they canoed and the privations they suffered than anyone I ever knew. He was intensely interested not only in the history of medicine and the history of his region, but also in the general historical development of man in his long journey through time.

Among the many honors and positions occupied by this model physician of our time are included: membership in the National Research Council, Consultant to the Surgeon General of the United States Air Force, membership in the Aeromedical Panel of the United States Air Force, Consultant to the Advisory Council on Medical Sciences of the Department of Defense. In these assignments he traveled all over the world. An impressive feature of his worldwide journey was his unfailing patience and good humor in the face of adversity, and also his ability to travel vast distances armed only with a razor, a toothbrush and a book. He would carefully launder his only shirt, socks and his underwear each night and turn up bright and shining next morning, looking as natty as anyone who journeyed with a huge wardrobe.

Don Hastings is gone now, and we shall miss him. He was a scholar of many interests. He was a teacher to whom many owe much. He was a patriotic and loyal citizen who served his country and his fellow man He was a husband and father such as most of us should strive to be. While we grieve, we must also share the grief of his lovely family. Organized medicine extends sincere condolence to Jane, Don Jr., Mary, and Jane Hastings Silver. He will live long in our memory and our gratitude.

John Regan M.D.
Minneapolis, Minnesota



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Vasodilan has not been reported to affect the course of coexisting disease; it has not been reported to affect blood sugar levels or to raise intraocular pressure.

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Vasodilan has not been reported to affect the treatment of coexisting disease; it is compatible with such drugs as hypoglycemics and miotics.

Vasodilan—compatible with your total regimen for vascular insufficiency

Vasodilan can be a valuable adjunct in planning a total therapeutic program for vascular insufficiency.

***Indications:** Based on a review of this drug by the National Academy of Sciences-National Research Council and/or other information, the FDA has classified the indications as follows:

Possibly Effective:

1. For the relief of symptoms associated with cerebral vascular insufficiency.
2. In peripheral vascular disease of arteriosclerosis obliterans, thromboangiitis obliterans (Buerger's Disease) and Raynaud's disease.

Final classification of the less-than-effective indications requires further investigation.

Composition: Vasodilan tablets, isoxsuprine HCl, 10 mg. and 20 mg. Vasodilan injection, isoxsuprine HCl, 5 mg., per ml.

Dosage and Administration: Oral: 10 to 20 mg., three or four times daily. Intramuscular: 5 to 10 mg. (1 or 2 ml.) two or three times daily. Intramuscular administration may be used initially in severe or acute conditions.

Contraindications and Cautions: There are no known contraindications to oral use when administered in recommended doses. Should not be given immediately postpartum or in the presence of arterial bleeding.

Parenteral administration is not recommended in the presence of hypotension or tachycardia.

Intravenous administration should not be given because of increased likelihood of side effects.

Adverse Reactions: On rare occasions oral administration of the drug has been associated in time with the occurrence of hypotension, tachycardia, nausea, vomiting, dizziness, abdominal distress, and severe rash. If rash appears the drug should be discontinued.

Although available evidence suggests a temporal association of these reactions with isoxsuprine, a causal relationship can be neither confirmed nor refuted.

Administration of single dose of 10 mg. intramuscularly may result in hypotension and tachycardia. These symptoms are more pronounced in higher doses. For these reasons single intramuscular doses exceeding 10 mg. are not recommended. Repeated administration of 5 to 10 mg. intramuscularly at suitable intervals may be employed.

Supplied: Tablets, 10 mg., bottles of 100, 1000, 5000 and Unit Dose; Tablets, 20 mg., bottles of 100, 500, 1000, 5000 and Unit Dose; Injection, 10 mg. per 2 ml. ampul, box of six 2 ml. ampuls.

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VASODILAN® 20-mg tablets

(ISOXSUPRINE HCl)

20 mg q.i.d. recommended dosage

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- 100% free theophylline
- individualized theophylline dosage schedule

Indications: For the symptomatic treatment of bronchospastic conditions such as bronchial asthma, asthmatic bronchitis, chronic bronchitis, and pulmonary emphysema.
Dosage: Initial: Adults: 1-2 capsules or 1-2 tablespoonfuls elixir every 6-8 hours, children 8-12: 1 tablespoonful or one capsule every 6-8 hours and children under 8: 3 to 5 mg theophylline/kg body weight every 6-8 hours. Theophylline dosage may be cautiously increased to 2000 mg/24 hr in adults or 7 mg/kg in children; monitoring of serum theophylline levels at higher dosages is recommended.
Precautions: Do not administer more frequently than every 6 hours, or within 12 hours after rectal dose of any preparation containing theophylline or aminophylline. Do not give other xanthine derivatives concurrently. Use in case of pregnancy only when clearly needed.
Adverse Reactions: Theophylline may exert some stimulating effect on the central nervous system. Its administration may cause local irritation of the gastric mucosa, with possible gastric discomfort, nausea and vomiting. The frequency of adverse reactions is related to the serum theophylline level and are not usually a problem at serum theophylline levels below 20μg/ml.
How Supplied: Capsules in bottles of 100 and 1000 and unit-dose packs of 100; Elixir in bottles of 1 pint and 1 gallon.

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Address

Health Care Costs and NHI (National Health Insurance) or Price-rationing Versus Panaceas

ROBERT W. GEIST, M.D.*

You may wonder why I am addressing the *Small* Business Council of our St. Paul Chamber of Commerce when I come from a $139.3 *billion* industry. Well, I really do belong here since I'm no "industry" but just an Urologist — a plumber if you will. Doctors, like small businessmen, respond to people knocking at their door — and especially if people stop knocking!

The Choices

The debate in the United States over health care costs and the control of these costs is taking place in the form of discussions about National Health Insurance (NHI). (NHI is not to be confused with NHS or a National Health Service in the English style.) In particular, what form should national health insurance take? There are two options having quite different philosophies and possible outcomes.[1]

The first philosophy proposes that people should have an adequate income to buy health care whether this be from having a job or from a subsidy when poor. Cost control would result when people have to pay directly out-of-pocket (i.e. have cost sensitivity) for non-catastrophic illness. Any illness that results in catastrophic financial loss would be fully insured. Catastrophic coverage is embodied in Congressional bills supported by the AMA and Senators Long and Ribicoff, but neither bill addresses itself directly to the lack of price-rationing for non-catastrophic illness which I will discuss later in this speech.

Proponents of the second philosophy say that people should have free access to health care and believe that health care services are akin to a civil right (or a "right to health care"). They believe that costs can be controlled by regulation, either through lids on expenditures and/or by paying commercial insurance companies and their agents a profit proportional to their ability to decrease the total cost of care. The public is looked on as too ignorant or self-indulgent to buy its own care when compared to the "sophisticated" planner or insurance company physician who would ration care properly. Bills by Senator Kennedy and Representative Ullman embody these concepts.

The key issue in the debate over National Health Insurance then is restoring balance in the medical market *either* with price-rationing of first dollar care, *or* with rationing all care through regulation and commercial companies. Both sides agree on insuring catastrophic illness.

Cost-price Rise

There are few mysteries about health care costs themselves so please go back with me a few years and review some statistics. We know health costs have been rising since just after the Civil War;[2] they rose more dramatically after 1950, and after 1965 when Medicare and Medicaid were implemented; they rose at a rate that captured the interest of government and industrial bureaucracies, labor leaders of large health and welfare funds, and promoters of panaceas for cost control. In the twenty-five years from 1950 to 1975 the share of the Gross National Product (GNP) devoted to health care had risen from 4.6 to 8.3%, or from $78 per year to $547 per year for each person, and to $1200 per year for the elderly.[3] The average cost of a hospital stay had risen from $311 in 1965 to $1017 in 1975 and a heart attack which cost $1449 in 1964 cost $3280 in 1971 (a 126% increase in seven years).

If one takes the total of $12 billion spent in 1950 and compares this with the $118 billion spent in 1975, we find the increase is due to three major factors.[4] General inflation accounted for 46% of the increase and population growth another 15%. But if there had been no increase in the number or quality of services delivered, the other 39% of the rise in total costs would not have occurred. Could this 39% of the cost have been kept down or what exactly did we buy? We know that in the 1930s, 40% of the population saw a physician once a year and as a whole the population averaged 2.5 visits per capita.[2b] Now 65% of us see a physician once a year and we average 4.8 visits per year with the poor averaging considerably higher than

Speech given to Small Business Council of the St. Paul Chamber of Commerce, August 16, 1977

*Former President, Ramsey County Medical Society.

all groups at 6.0 visits per year. And in the 1930's hospital admission rates were 60 per 1000 and are now up to 145 per 1000, but with a drop in average length of stay from 15 to seven days.[2c]

But we bought not only an increase in number of services, hospital beds and personnel, we also bought a change in the *type* of services. There are myriads of new sophisticated diagnostic and therapeutic technologies and highly trained personnel are necessary to run them (for example, intensive care units, SMAC auto analyzers, CAT scans, dialysis machines and so forth). The marked difference in the quality of service that $3200 bought in 1971 for the man with chest pain in a cardiac care unit with twenty-four hour surveillance can be compared to the unmonitored hospital room that was available for $1400 in 1965. Parenthetically, the difference in the quality of medical service makes cost comparisons with a basket of groceries difficult, if not impossible, since the medical product has changed but cauliflower has not.

Rise in Demand

There is no question that the rate at which we bought these services represented an unprecedented demand on available supplies. Shortages of physicians, nurses, hospital beds, and their ancillary services developed into what was called crisis proportions. The shortages were first filled in hospital beds, next in nurses, and there will be a real abundance of physicians in the 1980s. The only problem is that pouring medical providers onto nearly unlimited demand for medical services is like pouring gasoline on a fire — utilization, costs and prices continue to climb ever higher.

So how did this unprecedented demand, especially for expensive in-hospital services, get started? Martin Feldstein, the Harvard economist, has nicely detailed the reasons for these demand problems in his 1971 book.[5] First he noted that demand would have increased in any event because the real disposable income of an average worker rose 47% between 1950 and 1968. But the most important cause of this dramatic increase in demand had been the growth in insurance, both private and governmental. In 1950, about 50% of the people had third party insurance but by 1968, three years after Medicare and Medicaid were implemented, 86.8% were covered. Insurance now pays 90% of all hospital bills compared to 37% in 1950. For the average worker, private insurance had actually *reduced* the net cost (i.e. out-of-pocket cost) of hospital care by 16% between 1950 and 1968. Patients, having found the care in hospitals almost literally "free", found the hospital attractive to use, even for discriminatory illnesses. Since the very best in care cost no more, it was wanted. The economic signal to hospitals was clear and hospitals responded. The unpredicated effect of pre-paying first dollar care was to encourage hospitals to provide a more expensive product than consumers may actually have wished to purchase.

Maybe one can better appreciate what this meant for health care costs by an analogy. If all meat at the corner grocery suddenly appeared "free" because 90% was paid for by third party mechanisms, the grocer would not only expand the butcher shop but would have to stock sirloins instead of salami. Any rise in prices necessitated to produce more T-bones would be hidden because out-of-pocket payments would only increase at 10 cents for each dollar of cost rise. Of course, only the appearance is "free" since the true reckoning in premium costs comes later. That is why people don't insure groceries which are relatively small, recurring and predictable expenses.

So why does everybody buy first dollar health insurance if there is a sure reckoning when premiums are paid? But there is the nub of the problem, the reckoning doesn't really happen since it is hidden by a tax subsidy.[6] In World War II the Wage Controls Board ruled that health care fringe benefits were not taxable like other wages,[2d] Laborers wisely bargained for a maximum of health care fringe benefits to take advantage of the tax subsidy. They also insured what to them was the most likely large risk — a seven-day stay in the hospital. Not only did this result in an increase in demand and total cost, but with the added demand stimuli of Medicare and Medicaid in 1965, prices for the first time escalated at a rate in excess of general increases in the cost of living.[7] Unfortunately, when workers bought insurance for the most likely risk they ended up with what is called "upside down insurance" — upside down in the sense that funds are channeled through insurance plans for relatively small, recurring, and predictable expenses while a person remains open for real financial catastrophy from serious illness.[8]

Cost-Sensitivity

So what's the mystery about solving the problem of too much shallow first dollar insurance coverage which creates demand, pushing up prices, which necessitates buying more insurance to cover increased costs, which further creates demand and pushes up prices and so on in a vicious circle? Why doesn't Congress simply do away with the subsidy on health care insurance premiums and theoretically we would end up with an

economist's utopia — a public with cost sensitivity.

Let's look at the utopia for a moment. Workers would have to directly compare the cost of insuring first dollar care to the risk of spending a like amount on relatively small predictable expenses for care. When the high cost of insuring such first dollar care is no longer hidden by a tax subsidy, the worker would drop his shallow coverage and buy a much cheaper catastrophic policy. When the patient pays out-of-pocket for the first dollar of care — be this $1000, $2000 or 10% of income, depending on the proposal — he or she would ask the price of the surgeon, physician or hospital. Medical cost-price inflation would be stopped as patients became financially discriminating in demands for care and providers would be accurately informed where to expand services by the aggregate of millions of consumer decisions.

In fact, this proposal to do away with the tax subsidy on health care fringe benefits has been made by Martin Feldstein.[9] He observed that only in this way would decisions on the quality or quantity of services be based on consumer preferences.[10] Others fear that the alternative to basing decisions on consumer preferences would be to base them on the political whim of a bureaucracy or the profits of an insurance company management.[11] Joseph Newhouse, an economist with the Rand Corporation, estimated that a price sensitive public would reduce the cost of medical care to well below 8% of the Gross National Product.[1]

So why doesn't this utopia of price rationing in the medical market place happen when economic analysis and studies by the government and industry suggest re-making the public cost-sensitive? First of all, health insurance has become a way to save for a rainy day.[6] It would be difficult for almost anybody to find $1017 in his or her checking account for an emergency appendectomy. Secondly, have you considered what would happen to a Congressman facing his constituents after voting away their tax subsidy? Or what would happen to the labor leader if he lost this tax subsidy for his fellow workers? Even hospital boards and administrators would find a patient asking the price of a bed for an elective procedure a threat of immediate cash flow disaster. Insurance companies are no exception and support a bill in Congress (Burleson-McIntyre) that assures continuance of large volumes of premiums by an even stronger tax subsidy for health insurance. And I would wager that if physicians, especially surgeons like myself, were polled without benefit of the analysis we are making in this speech, we would find that "good" insurance means the kind that pays for my particular services — in full.

A sane economic policy may be utopian not because it is impractical, but because it lacks an organized constituency.

Panaceas

The crushing dilemma presented our bureaucratic and legislative leaders is the squeeze on one side by the "political reality" of not being able to rescind a tax subsidy to control costs while they are squeezed on the other side by their desperate desire to continue, at least, the appearance of people having "free" access to care. Legislators, corporate executives and labor leaders with large health and welfare funds therefore look at a promoter with a plausible panacea as a savior if he can deliver a plan with both "free" access *and* cost control. Since "free" access results in almost unlimited demand, every panacea must involve some sort of rationing technique. The bitter pill of rationing is only acceptable if the promoter can diagnose the "disease" that makes taking a pill necessary and if the pill can be made palatable with a chocolate-covered coating of slogans.

The Utility Pill

For example, Charles Edwards,[12] former Assistant Secretary of HEW, echoes the cry of cost control "crisis" because the medical "industry" is irresponsible in its orders for care. (One must conjure up a vision of a Medical Monopoly of America manipulating the public without constraint — the Board of Directors appropriately garbed in white coats.) He asks that a responsible government bureaucracy be created to handle this "industry" like any giant utility. Congress has, in fact, passed a template for such a bureaucracy with so-called "planning laws," the first of which was aimed at reducing hospital construction and expansion. The actual result was that citizens' councils, empowered under the Act like our own Metropolitan Health Board, did not perform with Draconian regulation but rather tried their best to help maintain and create a medical care system responsive to the public.

The Global Budget Pill

Meanwhile, Senator Kennedy echoes slogans of "medical care is a right" which costs too much because of "inefficiency" in a fragmented "cottage industry". (Here the vision changes from dealing with a giant utility to dealing with village sweat shops.) He promotes a bill that would insure everyone for 100% of all care. The bill proposes to control cost by capitation payments from a pre-assigned budget. Somehow "efficiency" will magically occur if there are no extra

funds to pay for the "free" access that has patients beating down the door. By some greater magic, one supposes the budget is to be kept under such circumstances. In actual fact, no other liberal Western democracy has been able to keep such a budget when the public begins to mind the cost of the lengthening queue necessary to get care.

The HMO Pill

Finally, Paul Elwood, the father of the HMO, promises the most. Like Senator Kennedy he promises ready access to care but will control costs with a new remedy called health maintenance.[13] He claims that if we would only pay doctors and hospitals an "incentive" to keep us well, their interest in disease (which by inference sounds diabolical) would be turned to the social good of a healthier population needing less care. Presto! — costs go down as quality goes up. The HMO promoter has been skillful in projecting an "incentive" payment for "sick" care onto physicians outside of the HMO where such "incentive" rebates simply do not exist unless one illegally splits fees with a consultant or has a cozy relationship with a hospital or drugstore ownership. Thus promoters justify the "incentive" paid by an HMO "for keeping people healthy". Not only is avaricious behavior falsely projected onto all physicians, but doctors may gain redemption by turning their natural avarice into a social "good" by decreasing utilization. The chocolate coating on the "health maintenance" pill stops tasting good when one realizes that people in the United States die and are chronically ill from diseases of longevity and life style (eating, drinking and smoking too much) over which no system of medical care has control.[14]

In fact, the HMO does not depend on slogans of health maintenance to control costs but pragmatically relies on a powerful mechanism for rationing care — their exclusive control of contracting for the benefits which are insured. For this reason, labor has been suspicious that HMO insurance companies and their agents, including physicians, may decrease orders for patient care in order to maximize their profits. Some pre-paid group plans do *not* pay profits and thus by strict definition are *not* HMOs since there are no "incentive" payments. (Profits can be delineated in a profession as pay for something *other than* a service rendered the patient such as a physician's "good behavior" in ordering care where "good" is viewed from the perspective of the person, e.g. a surgeon, or HMO company paying the "incentive bonus"). In any case, the HMO concept appears to be an insurance company millennium. A large volume of premiums (i.e. business volume) is assured and the company, rather than the patient, controls the expenditure of premium dollars. This allows manipulation of both the patient and the professional.

Looking at it from the perspective of government,[15] large corporations,[16] and labor leaders with large health and welfare funds, the real power of the HMO mechanism for cost control is attractive even if HMOs operate by making the health care of an enrollee a commodity for sale. For example, in one plan, the HMO primary physician co-insures hospital, surgical and other medical services of the patients he has as enrollees. He may increase profits by selling the patient to the surgeon or consultant having the best bid (or, of course, by not ordering services at all). What worries many physicians in our Ramsey County Medical Society is what sort of protection does the patient have if HMO laws legalize the commercial sale of his care to the best bidder — a form of sale that is illegal if the patient has an indemnity type insurance policy. Thus, in the old professional market place, medical services are sold to the patient by providers. In Elwood's new commercial medical market place, the patients may be sold by one provider to another for services.

The substitution of a commercial in place of a professional relation with the patient will leave HMO physicians open to criticism of being called profiteers especially if they succeed in decreasing utilization. It is difficult to imagine any *internal* peer review mechanism that would then be perceived as adequate to protect the patient from underutilization or manipulation since the reviewing doctor would have an obvious financial interest in all decisions not to prescribe care and to manage patient behavior. If the credibility of physicians is thus destroyed, more "objective" review of quality of care by government regulatory agencies will be perceived as a necessity and the Federal Trade Commission's claim that medicine is a mere conspiratorial trade association will be fulfilled and applauded. Curiously, HMO promoters claim their panacea is an alternative to government regulation while, in reality, their commercialization of medicine by treating patients as a commodity guarantees the real necessity of government intervention.

Conclusion

In summary, health care costs can be controlled if care is rationed. The debate over National Health Insurance is about who is going to do the rationing.

This speech does not attempt to explore fully the

probable consequences of rationing medical care *either* by government and commercial companies *or* by price-rationing for first dollar care. Either choice would have enormous consequences for individual patient freedom, for the ease of manipulating society, itself, and for the quality and nature of medical care and the profession. I have attempted to outline how we got into fiscal trouble with the kind of indemnity (first dollar) insurance we all acquired in the last three decades thanks to a tax subsidy. And I have tried to present the two markedly different choices the public has been told will control medical cost-price inflation through NHI. I hope this analysis will help move the public and our political leadership closer to a wise choice.

A Wise Choice

In my own personal view, a wise choice would: (1) preserve consumer choice in ordering primary and secondary care (government activity should attempt to guarantee this right and be concerned with insuring catastrophic losses), (2) preserve the right of people to a physician who is compensated only for the medical services he or she provides; patients have a right to be free from commercial manipulation for a profit by physicians, and (3) give the poor an adequate income for health care.

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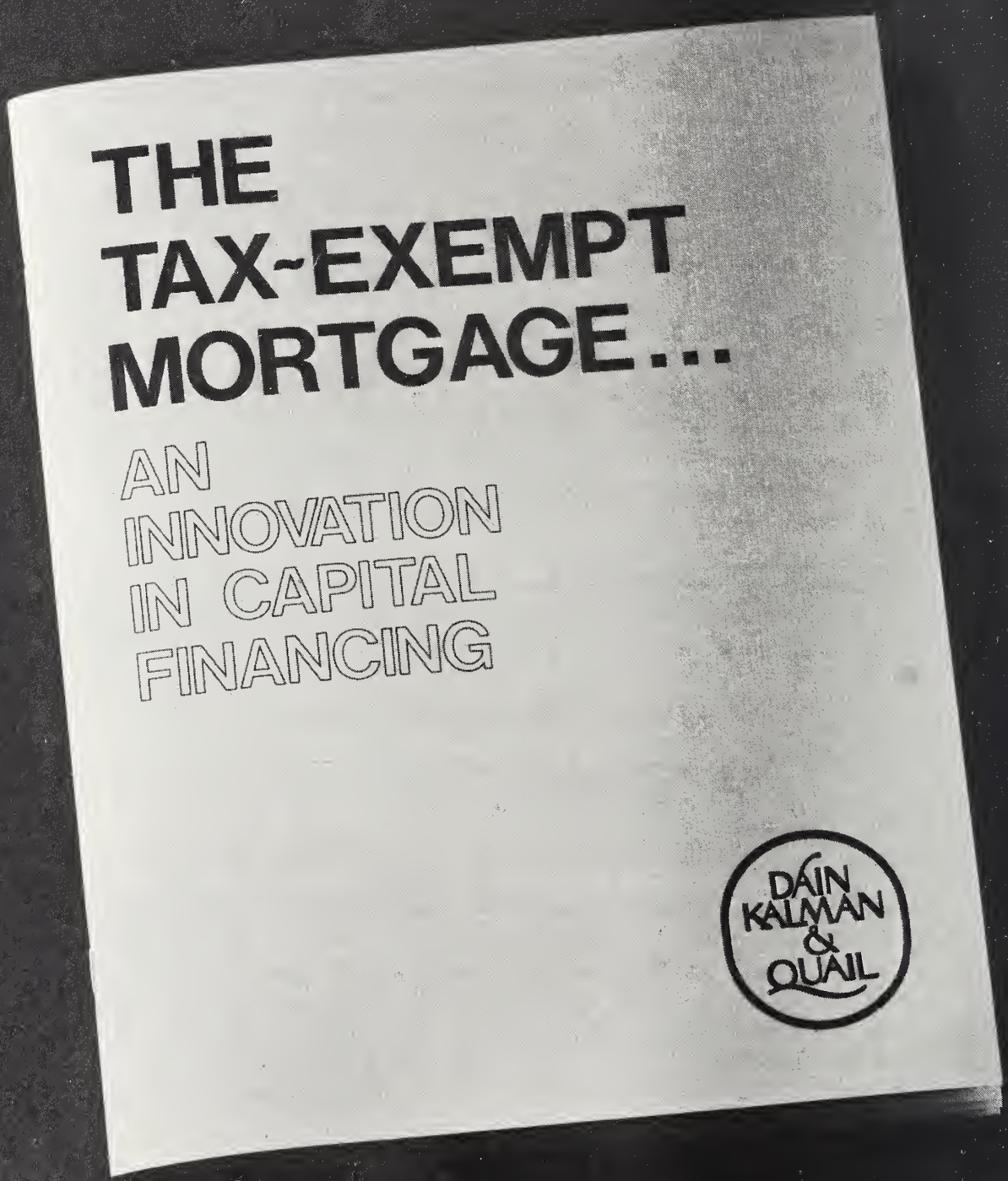
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Cover Mosaic

"Biography of the Surgeon"

Dr. Charles D. Ray, Vice-President, Medical Research, Medtronic, Inc., Minneapolis, is the artist of the cover mosaic.

The mosaic is 18" x 40" handlaid of sawn venetian glass mosaic tile mounted on a ¾' plywood backing, attached to 2' x 5' flat walnut frame. The subject matter is clearly an Egyptian theme. The symbolism is neurosurgical and represents an autobiography of the training of the artist. The principal figure has a number of anatomical features. In the frontal region, a skin flap has been opened revealing the bloody undersurface of the scalp. More posterially one sees a ventriculogram of the brain on which there is a superimposition of the semi-circular canal just behind the carotid artery and jugular vein. Segmented bones of the neck are noticeable as well as the origins of the brachial plexus. Around the shoulders of the figure is the cloak of medicine in blue and white and the cloak of science in gold and blue. The radiating yellow triangles represent hemostats used for turning a flap overlying the surgical drapery. Extending above the head of the subject is a profile of the hawk Horus, the traditional God of Egyptian medicine. His wing becomes the left arm of the surgeon, as it passes into the operative area on the right.

The right hand of the surgeon holds an obvious percussion hammer symbolizing neurological diagnostics. Just in front and to the right of the hammer, there is the vague outline of an enlarged claw of the hawk which contains a large mass of small details; euphemistically this represents the great mass of tiny little details important to neurological diagnostics. Below the large, pale wedge representing the vision of the surgeon, lies a bundle of lotus blossoms signifying beauty in life. An amber leather band binds the blossoms together. Standing upright near the center is an Egyptian *Was*, a symbol of authority and responsibility.

Between the area on the left, signifying the practice of neurosurgery, a spectrum of bright colors divides the two — the colorful separation between theory and practice. In the gray zone on the right one sees very clearly four principal objects. These are the left hand of the surgeon, the masked assistant nurse, the *Ankh* symbolizing the living, eternal practice of medicine and then a *Cartouche*. The Cartouche, traditional in hieroglyphics, ordinarily contains the name of royal individuals; in this case, it represents the life of the patient lying on the operating table. Within the Cartouche, at the top, is a disc of the goddess *Hathor* symbolizing the sacred life of the patient and beneath this one sees a yellow lancet and multicolored gelatin capsule representing the surgical and medical practices associated with surgery.

The mosaics were sawn in order to be carefully fitted, since practically no grout is used in the construction. The eye of Horus is a polished snowflake obsidian. The eye of the surgeon and the sun disc of Hathor are made of polished Tiger's eye (a silicated asbestos). The percussion hammer is cut and polished from a piece of petrified (jasperized) dinosaur bone! The gold reflective parts are inlaid from the venetian glass *smalti*.

The entire construction took approximately two years, working slowly, on weekends after cases and between the unending responsibilities of a neurosurgical resident.

Dr. Ray's painting "The Three Physicians" appeared on the March, 1977, cover of MINNESOTA MEDICINE.

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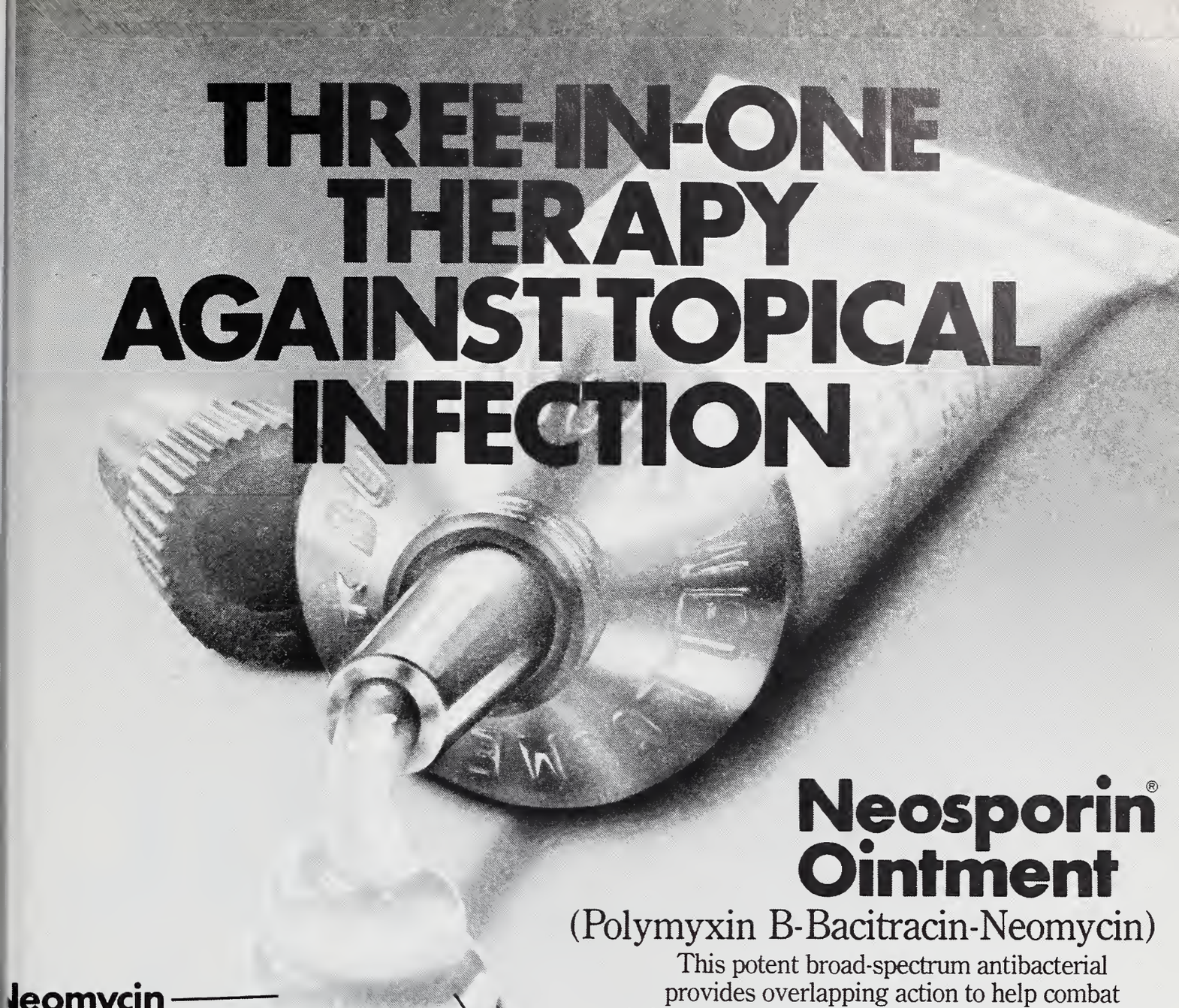
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rns, trophic ulceration and other extensive conditions
ere absorption of neomycin is possible. In burns
ere more than 20 percent of the body surface is affected, especially if the patient has impaired renal function or is receiving other aminoglycoside antibiotics concurrently, not more than one application a day is recommended.

When using neomycin-containing products to control secondary infection in the chronic dermatoses, it should be borne in mind that the skin is more liable to become sensitized to many substances, including neomycin. The manifestation of sensitization to neomycin is usually a low grade reddening with swelling, dry scaling and itching; it may be manifest simply as failure to heal. During long-term use of neomycin-containing products, periodic examination for such signs is advisable and the patient should be told to discontinue the product if they are observed. These symptoms regress quickly on withdrawing the medication. Neomycin-containing applications should be avoided for that patient thereafter.

PRECAUTIONS: As with other antibacterial preparations, prolonged use may result in overgrowth of nonsusceptible organisms, including fungi. Appropriate measures should be taken if this occurs.

ADVERSE REACTIONS: Neomycin is a not uncommon cutaneous sensitizer. Articles in the current literature indicate an increase in the prevalence of persons allergic to neomycin. Ototoxicity and nephrotoxicity have been reported (see Warning section).

Complete literature available on request from Professional Services Dept. PML.

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WASHINGTON, Aug. 26, 1920—



Social Security Bill Is Signe
Gives Pensions to Aged, Jo

Roosevelt Approves Message Intended to Benefit 30, Persons When States Adopt Cooperating Laws—H the Measure 'Cornerstone' of His Economic Prog

WASHINGTON, Aug. The Social Security Bill, a broad program of une insurance and old age and counted upon to be 20,000,000 persons, beca day when it was signed dent Roosevelt in the p those chiefly responsibl ting it through Congres

Mr. Roosevelt cal "the cornerstone in a which is being built m means comple

SENATE APPROVES 18-YEAR OLD VOTE IN ALL ELECTIONS

Amendment to Constitution is Sent to House, Where Passage is Expected

WASHINGTON, March 10, 1971—The Senate approved today, 94 to 0, and sent to

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NEW WORLD HOPE

President Hails 'Great Instrument of Peace,' Insists It Be Used

HISTORIC LANDMARK

Meeting Gives Standing Ovation as Executive Pictures Peace Gain

"If we fail to use it," he declared to the solemn final meeting of the delegates, 'we shall betray all of those who have died in order that we might meet here in freedom and safety to create it.'

"If we seek to use it selfishly—for the advantage of any one nation or any small group of nations—we shall be equally guilty of that betrayal."

Fervent Interpolation

The President, speaking in the auditorium of the War Memorial Opera House, built in memory of sons of the Golden Gate city who gave their lives in the first World War, in which he himself served, seemed to give unconscious expression to the solemn feeling of the occasion when, at the outset of his speech, he interpolated the words, half a hope, half a prayer:

"Oh, what a great day this can be in history!"

Just before the plenary session the President accompanied the

WASHINGTON, Jan. 27, 1973—"With the signing of the peace agreement in Paris today, and after receiving a report from the Secretary of the Army that



PATIENT PACKAGE INSERTS: A CONCEPT WHOSE TIME HAS COME?

The consumer's right to know is an irreversible and desirable trend of the Seventies. It extends, and properly, to a patient's right to know more about his or her prescription medications. One way, gaining favor, is through patient package inserts. Wisely-prepared and properly distributed when medically indicated, they could markedly improve patient knowledge and drug therapy—laudable goals by anyone's standards.

The PMA endorses these goals and will work with government, the health professions and consumers to achieve them.

The Advantages

The concept holds promise of benefits: better patient understanding of the product prescribed, better adherence to the treatment plan, and more awareness of possible side reactions.

Every doctor has had patients who fail to finish antibiotic regimens because they feel better. Some patients assume that if one tranquilizer or analgesic is good, two may be twice as good. Still others fail to report dizziness while on antihypertensive therapy —and so on.

Problems like these might arise less often if the patient received written information in addition to verbal instructions. Some studies suggest that patients are more receptive to such materials, and they more often understand the verbal instructions and follow them, when inserts are used.

The Disadvantages

There are also some potential problems. Obviously, the inserts must be clearly phrased, without extraneous or complex detail. How much information is enough? How can it be kept current? Should all patients receive the same information? Should inserts be included with all drugs? Should only potential problems be listed or are patients better off with a "fair balance" presentation that describes usefulness as well as drawbacks?

These and similar questions require answers, since model inserts have yet to be properly developed and tested. Despite the need for these studies, the FDA is proceeding prematurely with inserts on selected products. We think the Congress is the only place where the matter can be given the proper legal status and direction, particularly since it represents a conceptual change in the legal, medical and social framework of the nation's prescription drug information system.

The Solution

The PMA believes that carefully-devised pilot studies of various kinds of inserts are needed. They should be developed and implemented with full participation by doctors, pharmacists, consumers, communications experts and the drug industry. Such studies will provide reliable pathways to follow, so that inserts will be useful aids to medical practice.

And particularly we think that you should be closely involved in this debate and in these studies and decisions. Otherwise, people with less experience and qualifications may control the purposes, content and use of a tool with considerable promise for improved patient care. It could make a difference in your practice tomorrow, and more importantly, in the health of your patients.

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Minnesota Medical Association

The Impaired Physician

In June, 1976, the MMA House of Delegates supported the concept of the Sick Doctor Committee. The "sick doctor" can be described as any physician in Minnesota who is significantly impaired by way of a physical or mental illness so that he or she has created a hazard to himself/herself or the general public.

The AMA recognized this problem on a national level and supported component medical societies creating committees of physicians helping physicians.

It is generally pointed out that most impairments would be due to drug abuse and the main abuse would be alcohol. Our experience in Minnesota would bear this out. There are a minority of reports coming to the State office regarding psychiatrically or physically impaired physicians.

To date (12/31/77) or one and a half years since its existence, the Sick Physicians Committee has dealt with 41 physicians. A number of the earlier physicians who came to the committee's attention had already had contact with the State Board of Medical Examiners. More recent reports coming to the committee reflect earlier case findings, a situation hoped for by the committee. One physician reported to the committee was not felt to have a problem. Two physicians reported to the committee were felt to have psychiatric impairment and were receiving help.

Mode of Action

Calls regarding a potentially impaired physician are generally received at the State Office Headquarters (222-6366). The caller's name and phone number are then passed on to the committee chairman or his designee. The state office does not necessarily get the name of the impaired physician. Calls come from physicians, hospital administrators, nurses, doctors' wives, patients and pharmacists.

The chairman or his designee then contacts the informant to receive the name of the impaired physician, the nature of the impairment, permission, where necessary, to verify the problem with another source, if it would not jeopardize the informant or the impaired physician.

The chairman then turns this information over to two physicians on the committee who in turn contact the impaired physician, arrange a mutually agreeable meeting place and present the facts as they have them. It is usually readily apparent to the committee physicians what the problem is. (It is not always that apparent to the impaired doctor.)

The purpose of the committee is explained to the doctor; i.e.,: (1) We are physicians helping physicians. (2) We are here because we are interested in you. (3) We have experience in dealing with your type of problem. (4) We can offer treatment alternatives. Since most physicians have alcohol or other drug impairment, treatment suggestions are given. These include: (1) Alcoholics Anonymous, (2) Names of acceptable treatment centers, (3) Follow-up care, and (4) Family involvement. Most physicians, after some initial hesitancy, seek help.

There is a provision in our committee structure to present information to the State Board of Medical Examiners should the doctor refuse to take the advice of the committee physicians. Of the forty-one physicians so far handled by the committee, this action has not been required. The committee physicians try to make it clear that we are there to help the physician *preserve* his license and allow him/her to continue to practice. We point out that by not intervening early, the doctor and his patients assume greater risks. Anonymity is stressed.

Summary

The Sick or Impaired Physicians Committee appears to be functioning well at this early stage — too early to give an accurate assessment of its long-term goals; i.e., early intervention and help for the impaired physicians. Forty-one physicians have come to the attention of the committee, since its inception July 1, 1976. It is felt that after significant interventions and recoveries are made, this in turn will breed a confidence for other physicians to come forward and recommend help for an impaired colleague.

T.G. Briggs, M.D.
Chairman
The Impaired Physician Committee

1978 Minnesota Medical Association Annual Meeting

May 11-12, Duluth, Minnesota

CLINICAL MEDICINE EXPLORED . . . In planning the 1978 scientific program for the MMA Annual Meeting, we did a little exploring to add some new to the old. We looked at the time format and decided to experiment. There are courses from 8-11 a.m. and 2-5 p.m., leaving three hours for visiting the exhibits and having lunch or attending your specialty society meeting. There are six hours of CME each day, as before, but more time is allowed between sessions to do what we tried to fit into 90 minutes in other years.

Your requests told us to keep it practical, so you'll find an assortment of coursers planned toward that end. We tried a little bit of several things. Some courses cover a variety of topics. Several present an in depth study of one subject. Many of the courses this year will require some advance preparation. Early preregistration assures your reservation for the courses of your choice.

More than ever before physicians are looking for CME excellence in the courses they choose to fulfill license and specialty requirements. The 1978 MMA program is accredited in Category I for the A.M.A. Physician's Recognition Award and Prescribed Credit for the A.A.F.P., and we take our accreditation seriously. Presented in cooperation with several state specialty societies, this program is designed to provide continuing medical education of high quality to the doctors of Minnesota.

Clinical Medicine Explored:12 hours of accredited continuing medical education in Duluth on May 11-12. Watch for your registration materials in the mail, and reserve those dates to attend. We planned this meeting especially for you. We think you're going to like it.

S. V. Thorson, M.D.
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Clinical Pharmacy

Amikacin
A New Aminoglycoside Antibiotic

DARWIN ZASKE, Pharm.D.* and KENT CROSSLEY, M.D.†

Amikacin is a new aminoglycoside antibiotic with impressive activity against gram-negative bacilli. This article reviews the literature dealing with the antimicrobial activity, pharmacokinetics, and usage of this antibiotic.

AMIKACIN IS THE newest of the aminoglycoside antibiotics available for clinical use. Members of this family of antibiotics (which includes kanamycin, gentamicin and tobramycin) are widely prescribed for the treatment of infection caused by aerobic gram-negative bacilli. Amikacin has shown promising activity against this group of pathogens. Of particular interest, amikacin has been found to be effective both *in vitro* and *in vivo* against the majority of gram-negative bacilli which are resistant to gentamicin and tobramycin.[1,2] The impressive activity of this new aminoglycoside is not surprising, for its discovery resulted from a systematic attempt to synthesize derivatives of kanamycin which would have substantially greater activity against gram-negative rods than the parent compound.[3]

Antimicrobial Activity

The principal indication for the use of any aminoglycoside is the treatment of gram-negative bacillary infection. Published studies indicate that amikacin has the broadest spectrum of activity against gram-negative rods of the aminoglycosides.[1,4] It is effective against most isolates of *E. coli*, *Klebsiella pneumoniae*, Enterobacter species, *Serratia marcescens*, Proteus species, and *Pseudomonas aeruginosa*. Although uncommon, resistance to amikacin has been noted in a variety of gram-negative bacilli, notably in strains of *Pseudomonas aeruginosa*, *Serratia marcescens*, *E. coli* and *Proteus rettgeri*.[1]

In one recent report, 807 clinical isolates of gram-negative bacilli were tested against six aminoglycosides; 88% were susceptible to amikacin at concentrations of $\leq$ 4 μg/ml.[4] This represents considerably greater activity than was demonstrated with other tested aminoglycosides (including gentamicin and tobramycin). Even among strains of gram-negative rod bacteria resistant to one or more aminoglycosides, 80 - 85% were susceptible to amikacin.[1]

Other non-bacillary gram-negative bacteria (e.g. *Neisseria gonorrheae*, *Neisseria meningitides*, and *Hemophilus influenzae*) are susceptible to amikacin, but usually are most appropriately treated with antibiotics other than the aminoglycosides.[5] All anaerobic bacteria are resistant to amikacin and related antibiotics.

Among gram-positive organisms, nearly all strains of *Staphylococcus aureus* are susceptible to amikacin and similar aminoglycosides. These drugs, however, are rarely indicated for the treatment of staphylococcal disease. The majority of other gram-positive bacteria of clinical significance (Group A β-hemolytic streptococci, *Streptococcus pneumoniae* and Group D streptococci) are resistant to amikacin and related antibiotics.[5]

For clinical purposes, amikacin-sensitive organisms are those with a minimal inhibitory concentration of $\leq$ 16 μg/ml. Using a 10 μg amikacin disc, a zone $\leq$ 11 mm implies resistance, zones of 12 or 13 mm are considered intermediate, and a zone $\geq$ 14 mm is interpreted as indicating susceptibility.

The nature of resistance to amikacin and other aminoglycosides is best understood in gram-negative bacilli. These organisms usually possess plasmids which direct production of enzymes that inactivate these antibiotics.[6] Plasmids (or 'R factors') may be transferred between different species of gram-negative rod bacteria; this is assumed to be the primary mechanism for the dissemination of antibiotic resistance amongst gram-negative bacilli.

There are about a dozen enzymes which inactivate one or more of the aminoglycoside antibiotics.

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Supported by the Medical Education and Research Foundation of St. Paul Ramsey Hospital, St. Paul.

Because the site of action of most of these enzymes is known, amikacin could be designed to be minimally affected by enzymatic activity. Three enzymes are known to modify the structure of amikacin. These mediate 6′-*N*-acetylation, 4′-*O*-adenylylation, and 3′-*O*-phosphorylation. The first of these enzymes is known in gram negative rod bacteria and the second and third have been identified in isolates of *Staphylococcus aureus*.[1,7,8] The phosphorylating enzyme, although modifying the structure of amikacin, does not confer resistance to this drug. Some amikacin-resistant gram-negative bacilli produce the 6′ acetyltransferase, but resistance to this drug may also result from a mutation which prevents penetration of the bacterium by this antibiotic.[1]

Pharmacokinetics

Amikacin may be administered either intramuscularly or intravenously. After intramuscular injections, peak serum levels are achieved within 45-120 minutes.[9] Absorption appears to be complete within four hours after administration. Peak serum levels measured after an intramuscular dose of 7.5 mg/kg were approximately 20 μg/ml.[9,10] With the same dose administered intravenously, the peak serum levels averaged 38 μg/ml.[9]

Amikacin is mainly eliminated via the kidney by glomerular filtration.[10] This route of elimination accounts for 85-95% of the dose administered.[9,11] The urinary concentrations after a dose of 7.5 mg/kg range from 38-1612 μg/ml.[11] These concentrations greatly exceed the level necessary to inhibit bacterial growth for sensitive organisms (< 4 μg/ml). Thus in patients with an uncomplicated urinary tract infection, a lower dose (e.g. 3.7 mg/kg) may be used to provide therapeutic urine concentrations.[12,13]

A wide variation in the elimination of amikacin has been demonstrated even in patients with normal renal function. Serum concentrations resulting from a standardized dose (e.g. 7.5 mg/kg) will be similarly variable from patient to patient. Plantier[11] reported an average half-life of 1.4 hours with a range of 0.8 to 2.12 hours in 10 adults with normal renal function. (Figure 1) Clarke[9] and Lode[14] reported similar mean values of approximately two hours. In newborn infants, Sardemann[15] and Howard[16] reported mean half-lives to be approximately six hours. They also found the half-life to change inversely with age. The half-life decreased from six hours in the first days after birth to three hours at one month of age. This finding has been reported for the other aminoglycosides.[17]

In patients with compromised renal function, the half-life is prolonged and dosage modifications are necessary to prevent a potentially toxic accumulation of the drug. McHenry[18], Pijck[12], and Plantier[11] have demonstrated a significant correlation between creatinine clearance and elimination of amikacin. The serum half-life and dosage regimen can be estimated in these patients by knowing the serum creatinine and using the "Rule of Nines". The serum creatinine (mg/%) multiplied by a factor of three provides an estimate of the drug's half-life (hrs). The dosage interval (hrs) can then be calculated by multiplying the half-life (hrs) by a factor of three or by multiplying the serum creatinine (mg/%) by a factor of nine. Because of the interpatient variability in correlating the serum creatinine and the drug's half-life, serum amikacin levels should be measured, if possible, to further individualize each patient's dosage regimen.

The distribution volume (L/kg) is a kinetic parameter which describes the change in serum concentration (mg/L) observed after a given dose (mg/kg). Thus patients receiving the same dose (7.5 mg/kg) and having different distribution volumes, will achieve different peak serum concentrations. (Figure 2)

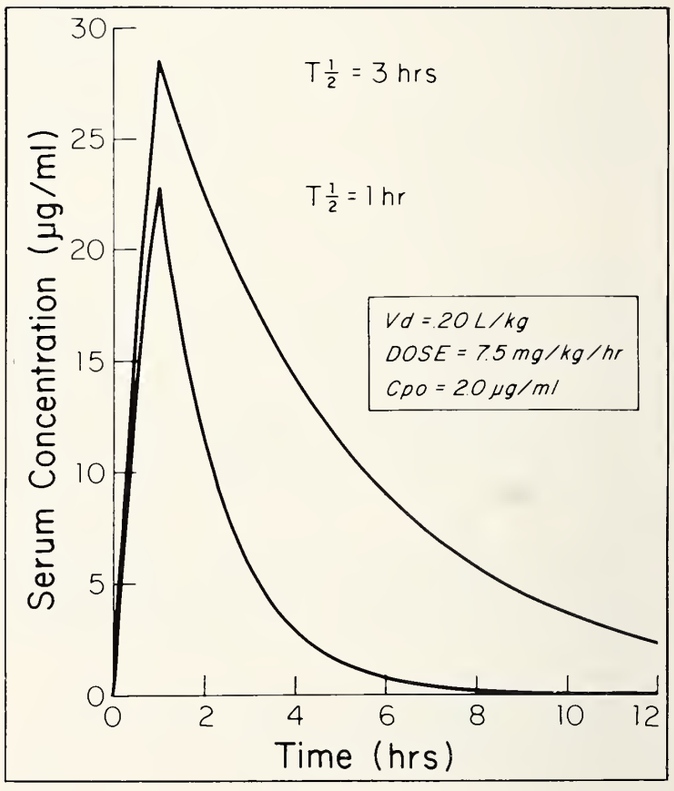


Fig. 1—*The effect of a decreased half-life on serum levels of amikacin during a dosing interval.*

The computer simulation illustrates the serum concentration-time curve for two hypothetical patients after receiving an amikacin dose of 7.5 mg/kg administered over one hour. The two subjects were assumed to have a pre-dose serum concentration of 2 μg/ml and a distribution volume of .20 L/kg. The amikacin half-lives were one and three hours in each patient.

Several investigators have reported the distribution volume in adults to average .18-.21 L/kg of body weight.[10,14] However, the range has varied from .13 - .48 L/kg of body weight. The distribution volume averaged 0.6 L/kg in the younger newborns and 0.5 L/kg in older infants.[19]

The drug distributes with a volume that closely resembles the extracellular fluid compartment. The distribution volume will vary from patient to patient, or even in the same patient, depending on the state of hydration. A dehydrated patient, receiving the suggested dose of 7.5 mg/kg will achieve potentially toxic serum concentrations (> 32 μg/ml). This may explain why patients who are volume depleted or receiving diuretics have an increased risk for aminoglycoside toxicity. Alternatively, a patient with a large distribution volume will require an increased dose to achieve the desired peak concentration. In newborns where the distribution volume is .5 - .6 L/kg, an increased loading dose of 10-18 mg/kg has been suggested.[15]

Dose

The manufacturer's recommended dose of amikacin in adults with normal renal function is 15 mg/kg/day given in two or three equally divided doses. The total daily dose is suggested not to exceed 1.5 gm/day and the total duration of treatment not to exceed 10 days or 15 gm. If given intravenously, the dose should be infused over 30-60 minutes to prevent exceedingly high serum concentrations.[14] In patients with compromised renal function, the dosage interval (hrs) can be calculated by multiplying the patient's serum creatinine (mg/%) by a factor of nine. The recommended dose of 7.5 mg/kg should be administered every interval. If available, serum amikacin levels should be measured to insure therapeutic levels and to prevent possible toxic accumulations of the drug.

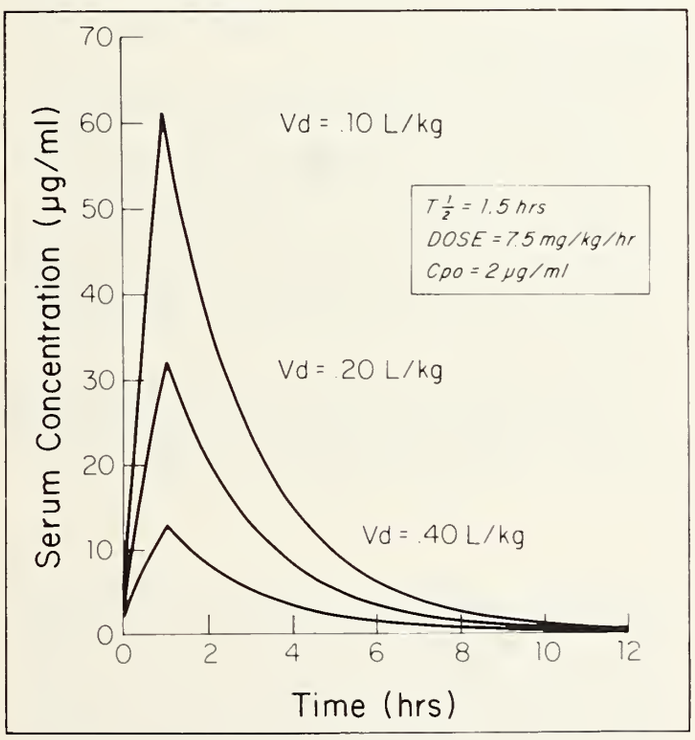


Fig. 2—*The effect of different distribution volumes on serum amikacin levels.*

The computer simulation illustrates the serum concentration-time curve for three hypothetical patients after receiving a dose of 7.5 mg/kg administered over one hour. The subjects were assumed to have a pre-dose concentration of 2 μg/ml and a half-life of 1.5 hours. The distribution volumes were .10, .20 and .30 L/kg.

Side Effects

Ototoxicity and nephrotoxicity are the most frequent side effects associated with amikacin therapy. Of the 1,098 patients who received amikacin in clinical trials[20], 16 patients (1.5%) developed a neurosensory hearing loss. These were mainly high frequency losses which did not impair conversational hearing. Vestibular dysfunction was demonstrated in 11 patients (1%). In nine of these patients, the change reversed after discontinuing therapy. Changes in renal function occurred in 37 patients (3.4%). Of these, 28 were considered mild or transient. Other infrequent reactions were reported including alterations in hematologic parameters, liver function tests, hypersensitivity reactions, and central nervous system reactions.

Black evaluated cochlear function in 44 patients receiving 7.5 mg/kg of amikacin every eight hours.[21] Using their criteria for defining changes in cochlear function, 13 patients (24%) developed either a bilateral (seven patients) or unilateral (six patients) hearing loss. These changes usually occurred at the high frequencies and did not interfere with conversational hearing. In three patients, the deficit was demonstrated to be reversible. The major risk factors associated with these cochlear changes included duration of therapy (> 10 days), total dose (> 15 gm), previous aminoglycoside therapy, elevated peak serum levels (> 32 μg/ml), and elevated trough serum levels (> 10 μg/ml). The authors suggested that monitoring of serial audiograms, renal function tests, and serum amikacin levels may reduce the risk of ototoxicity for patients requiring a high dose for a long duration.

Clinical Use

Aminoglycoside antibiotics are indicated only for the treatment of certain types of bacterial infections. While these drugs may be safely utilized, they are potentially more toxic than antibiotics such as the penicillins and cephalosporins. The use of any aminoglycoside is only appropriate in the initial

treatment of serious undefined infection and for therapy of infections caused by bacteria which are not susceptible to less toxic antimicrobial agents.

The place of amikacin in the treatment of gram-negative rod infection is now being defined. Clinical studies have demonstrated that both in normal hosts and in patients with malignancies, this drug is effective in the treatment of urinary tract infection, bacteremia, and pneumonia caused by susceptible organisms.[22] Amikacin has also been shown to be effective in the treatment of infections caused by organisms which are resistant to gentamicin and tobramycin.[2]

Recently reported randomized studies have compared amikacin with gentamicin and amikacin with tobramycin. In the amikacin-gentamicin comparison, the overall favorable response rate in patients with serious gram-negative rod infection was 77% for amikacin and 78% for gentamicin.[23] The occurrence of nephrotoxicity and ototoxicity with the two drugs was identical. Studies comparing amikacin with tobramycin were conducted in 175 patients with cancer. Of patients infected with gram-negative rod bacilli, 67% responded to therapy with tobramycin and 69% had a favorable outcome following treatment with amikacin.[24] Although ototoxicity was not carefully studied, nephrotoxicity occurred with equal frequency in the two groups.

Amikacin shares many properties with other aminoglycosides. A few comments which apply to this drug, as well as to gentamicin and tobramycin, are necessary. It must be emphasized that none of these antibiotics is active against a broad range of bacteria. The practical implication of this observation is that because of the resistance of anaerobic bacteria, streptococci, etc. to these agents, another antibiotic (such as a penicillin or cephalosporin) should be used in conjunction with an aminoglycoside in the initial therapy of undefined infection. Secondly, none of the aminoglycosides adequately penetrate the central nervous system. Thus, amikacin and related antibiotics are *not* appropriate for the treatment of gram-negative meningitis unless the antibiotic is administered intrathecally. Finally, because of *in vitro* synergy between gentamicin or tobramycin and carbenicillin against *Pseudomonas aeruginosa,* systemic infections caused by this organism are usually treated with a combination of carbenicillin and an aminoglycoside. Studies have demonstrated that synergy also occurs with amikacin and carbenicillin, and it would be appropriate to use these agents together when treating infections caused by *Pseudomonas aeruginosa.*[25,26]

Amikacin will be a valuable addition to the family of aminoglycoside antibiotics. But it must not be used with indiscretion. Past experience would strongly suggest that if amikacin is widely used, significant problems with bacterial resistance must be anticipated. Emergence of organisms resistant to gentamicin and tobramycin is well documented; in some hospitals over 25% of gram-negative rod bacteria are resistant to gentamicin. At least two studies have already demonstrated that amikacin therapy may be associated with the emergence of organisms resistant to this antibiotic.[27,28] For these reasons (and because gentamicin and tobramycin are equally efficacious in infections caused by susceptible organisms), we feel that the usage of amikacin should be limited to the following indications:

1. Therapy of infection caused by gram-negative bacilli shown to be resistant to gentamicin or tobramycin.
2. Initial treatment of hospital-acquired gram-negative rod infection occurring in institutions in which resistance to gentamicin and tobramycin is a significant problem.
3. Initial therapy of serious infection in patients likely to be infected with multiply-antibiotic-resistant gram-negative bacilli (e.g. patients with hematogenous malignancies and patients who have been hospitalized for prolonged periods of time).
4. Treatment of infections caused by gram-negative bacilli which are not responding to therapy with another aminoglycoside. Obvious causes for drug failure (e.g. an undrained abscess) should be excluded before changing antibiotics.

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15-28. Will be found on page 95.

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APPLICATIONS WELCOMED from board qualified or certified Radiologists. Large teaching hospital, upper Midwest; university affiliation. Subspecialty training helpful. Write: Minnesota Medicine-529, 101 E. 5th St., St. Paul, MN 55101.

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GROUP HEALTH PLAN of Minnesota opening new center in attractive mid-sized community (one hour NW of Twin Cities). Seeking Family Practitioners; must be board certified or board eligible. Excellent salary and fringe benefits. Send CV to Box 80100, St. Paul, MN 55108.

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FAMILY PRACTICE PHYSICIAN—To join group of six GP's, General Surgeon, and Family Counselor. Immediate workload, effective call system, early corporate opportunity with excellent salary and fringe benefits. Well equipped new clinic with over 11,000 square feet, group located in expanding community of over 10,000 with excellent educational and recreational facilities, only 30 minutes from downtown Minneapolis. Fully accredited 116 bed hospital in community. Call collect or write D. R. Lynch, M.D. or D. C. Fleming, Clinic Administrator, phone (612) 445-1305, Shakopee Medical Center, 1335 E. 10th Av., Shakopee, MN 55379.

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Letters to the Editor

Ski Injuries

Dear Editor:

Doctor Criqui's article on ski injuries (December, 1977)* points out a number of risk factors, several of which are shared, no doubt, by other sports — fatigue and lack of experience.

In cross country skiing, where injuries are fewer, these factors are probably significant as well. Another element, though, appears to represent a very important risk factor, and I am curious if other physicians share my experience. The majority of significant injuries I have encountered in both recreational and competitive cross country skiing have occurred on steep downhill turns. These parts of the course represent a combination of high speed and least stability where the skier is subjected both to injury from falls as well as collisions with trees and other obstructions near the trail. My feeling is that injuries, especially in racing, could be reduced by carefully laying out the course to avoid sharp turns on the steeper downhill sections and by placing downhill turns where trees and other obstacles are not immediately adjacent to the trail.

David Scott, M.D.
Physician, U.S. Nordic Ski Team

*See page 877.

Human ISG

Dear Editor:

H. Bruhl's report of adverse reaction to large doses of human ISG in the September issue of Minnesota Medicine* reminds me of experiences with large scale use of ISG for hepatitis prophylaxis while I was stationed in Asmara, Ethiopia.

It was command policy to administer 5 cc. of ISG on entry into and each five months while in the theatre. Retrospective studies suggested this policy was effective in controlling hepatitis[1] and composite studies confirmed these results[2].

In that most recipients served only twelve months in theatre, usually the number of doses received was two. Only local soreness seemed to complicate these injections. Approximately 15% of the personnel, however, were stationed for 30 months and often received as many as 5 to 6, 5 ml. doses of ISG. In these recipients, especially after the third or fourth dose, more significant reactions occurred, many similar to the events described by Dr. Bruhl. A subpopulation receiving multiple doses of ISG was the medical staff at the U.S. Army Hospital, Asmara. This group known for their detailed reporting of the smallest of adversities had the most trouble of all. Five of six had to discontinue q. 5 mo. administration of ISG because of systemic reaction occurring 3 days to 14 days after injection because of fever, severe muscular pain, arthralgia and nausea and vomiting. Unfortunately, no immunological studies or controlled studies were done, but to former afflictees the "reaction" to ISG was very real. The similarity to serum sickness was suggested.

It does seem prudent to suggest that though prophylactic use of ISG for an isolated hepatitis outbreak may be safe, repeated administration of ISG for chronic exposure prophylaxis may not be advisable until further immunologic studies can clarify the safety of this practice.

*Page 673.

J. G. Bergstrom, M.D.
Cokato, Minnesota

References

1. Unpublished data, Transactions Medical Staff, U.S. Army Hospital, Asmara.
2. A Cooperative Study: Prophylactic gammaglobulin for prevention of endemic hepatitis. Effects of U.S. Gammaglobulin upon the incidence of viral hepatitis and other infectious diseases in U.S. soldiers abroad. Arch Intern Med 128:723, 1971.

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TWO-YEAR PROGRAM AT DULUTH was initiated in 1972 with emphasis on family medicine; current enrollment is 48 first-year students, 36 second-year. Department head will be responsible for coordination of all clinical instruction; section heads in various other clinical disciplines chosen from community. Preference will be given to Board certified Family Physicians and other primary care specialists with some practice experience. Academic background should demonstrate strong skills in teaching at both undergraduate and graduate levels. Salary and rank negotiable, commensurate with experience. Interested applicants should forward curriculum vitae and supporting information by 3/15/78 to James G. Boulger, Ph.D., Clinical Sciences Search Committee, UMD School of Medicine, 2205 E. 5th St., Duluth, MN 55812. The University of Minnesota is an equal opportunity employer.

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FAMILY PRACTICE group in south metro suburban area wishes to expand to four family physicians. Interested physicians must be board certified or board eligible in family practice. Send inquiries or call Drs. Murray Hunter or Joseph Emond, River's Edge Medical Clinic, 310 Division Street, Farmington, Minnesota, 55024. 612-463-7181, Descriptive brochure available upon request.

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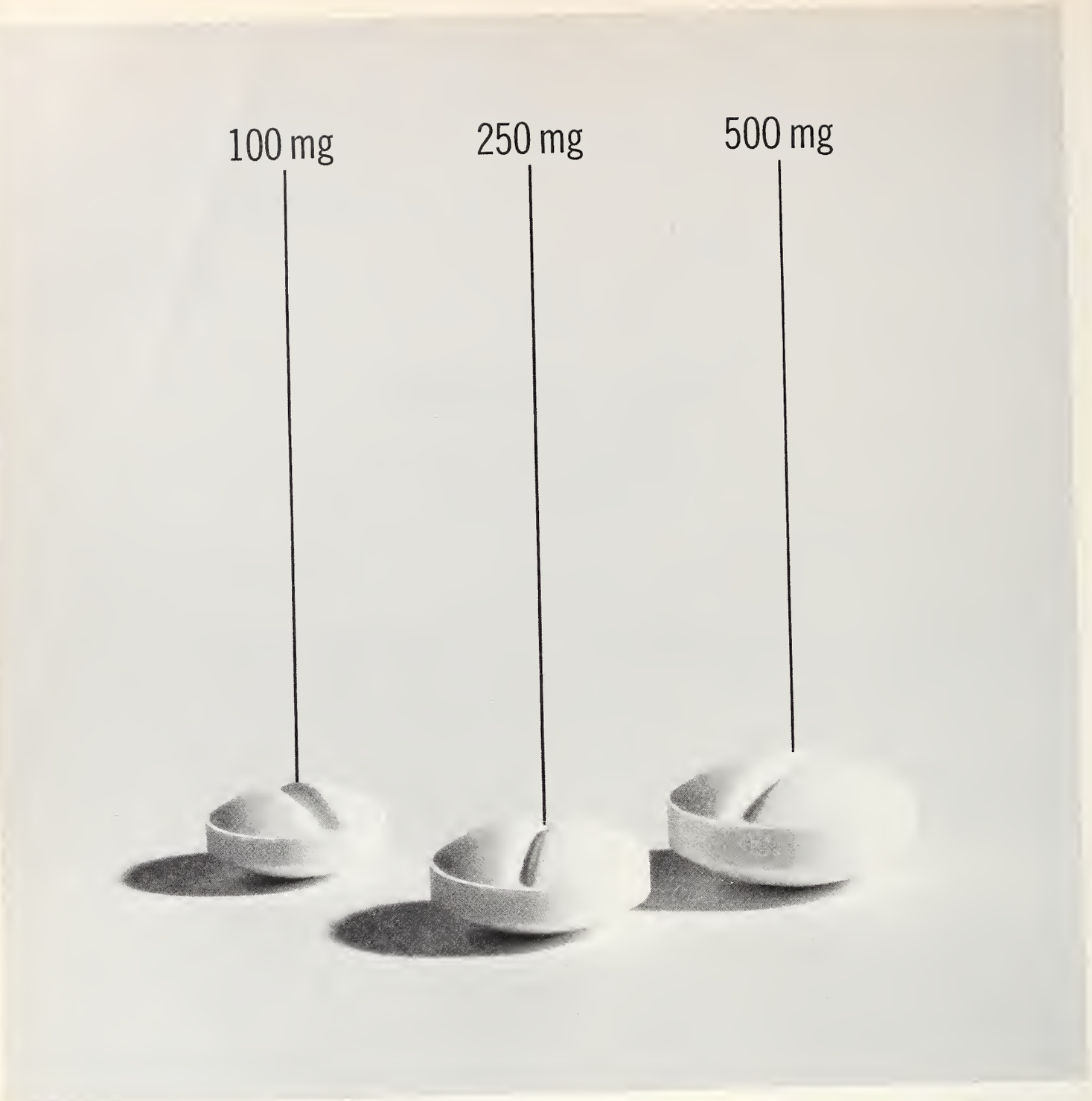
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The Advertising Pays for Your Journal

President's Letter



Freedom is Never Cheap

What sense can one make out of recent medical surveys? A recent University of Chicago survey found that 61% of the respondents think that there is a "crisis in health care," in the U.S., but 88% are satisfied with the health care they themselves receive. It is difficult to understand how a "crisis" can exist when only 12% of the people are unhappy with their health care. Or is it that difficult? My personal opinion is this is just another example of how influential the media has become.

Those who would foster government control of the entire health care industry (and the key word is control) have learned to use the media well to propagandize the "health care crisis." We who are private practitioners, busily engaged in ministering to the sick ten or twelve hours a day, have difficulty in understanding, say nothing about communicating with, the kind of people who are fostering government-controlled medicine. It will be well for us to understand the motivating influence of these people. Much of what follows then is taken from an article written by Dr. Peter C. Arnold, President of the General Practitioners Society of Australia, and published in the 1978 issue of *Private Practice*. I recommend it to you and would hope that you can obtain a copy and read the original article.

Dr. Arnold says the private practitioners must appreciate the fact that all politicians seek power and most politicians are determined to exercise that power and to be seen doing so. Government plays on the national sympathy of civilized man for the ill by exaggerating the role of medical care in the attainment of good health. We have ample evidence to support the fact that good health is little influenced by the amount or accessibility of medical care. It is influenced much more by emphasizing the importance of self-help through sensible living habits. Government plays on sympathy by exaggerating the inaccessibility of medical care for a minority of the population, because of cost or "maldistribution of facilities and manpower"; by exaggerating the inequities in medical care services available to different groups in the population; by exaggerating the financial rewards accrued by the medical profession; and by making extravagant claims of benefits to the public purse if government itself is permitted to finance and through financing control medical service. Government first starts by providing full medical services for the poor and then manipulates public sympathy into similar programs for the aged and other disadvantaged groups. Finally, government attempts to influence the public sufficiently so that they, the public, will buy a universal program under which all will be treated equally, because there should be no inequality of care. Then the government comes in and says not only should it be equal but the "best" care.

We must ask, the best of what? Best is a comparative and not an absolute. The "best" of fee-for-service care? The "best" of HMO care? The "best" of DPW care? The "best" of military care?

What government does not state is that equalization is in a downward direction. All will receive the standard of care previously offered to the needy through bureaucratic-administered schemes; rather than all receiving the higher standard available to the *majority* who choose where and for what services to spend their own money. Government involvement in medical care commencing as a purely financial

mechanism for assisting the needy progresses inevitably towards total control of all aspects of medical practice.

Government then starts offering to either underwrite the cost of medical insurance or to cover medical costs outright. "Free" medical care inevitably puts an ever-increasing demand on services provided by the government at zero or near zero cost. Government becomes a competitive factor for fee-for-service physicians — hoping that fee-for-service cannot survive against this "free" medical care bureaucracy. The problem in this entire thought process is that the cost of medical care provided by government escalates just as fast if not more rapidly than does the cost of providing medical care in the fee-for-service arena. Government medicine entails salaried physicians, nurses, social workers, psychologists, psychiatrists, physiotherapists, and on and on. And the cost of seeing the patient in the bureaucracy is inevitably more than seeing a patient in the private office.

At the hospital level, government has urged people for the last 15 to 20 years to seek the best of care which, of course, is at the hospital level where the life-saving facilities are; and where the costs are also the highest. In an attempt to control those hospital costs, the government provides another layer of investigators, public law administrators, regulators, etc. — all of whom cost more money. It's difficult for government to tell the public to abstain from using the hospitals, abstain from using "free" clinics, because these things were promised to them — so the cost escalates.

Consequently the government is forced to turn to the physicians in an attempt to control cost. Physicians, few in number, and extremely apathetic and nonunderstanding of the whole process, constitute a weak opposition for determined and organized government initiative. Government begins to blame the physicians for increased costs such as: physicians see too many patients who do not need to be seen, physicians do too many operative procedures, do too many lab tests, order too many x-rays, prescribe too much expensive medicine, and keep their patients in the hospital too long (sound familiar?).

What is even worse, government has the public now believing and a good share of the practicing physicians believing this fallacy: (a) Patients incur the costs of physicians' services. (b) Insurers reimburse patients; therefore, insurers have a legitimate interest in physicians' services. The Law of Contracts applies here as well as in any other contractial arrangement, i.e., insurer and patients have established a contract between them. It is the patients who have established a contract with the physician. There is *no* agreement between the physician and insurer. If the physician establishes a fee which the patient considers reasonable, it is of no relevance to the physician whether the patient is uninsured, covered by his employer, by a health insurance scheme, or by a government agency. The *private* doctor-patient relationship is just that — private. The private exchange of a service for a fee.

Does HEW then have the "legal responsibility to acquire an accounting by the practicing physician that services reimbursed by the government are of acceptable quality." The concept of public accountability of a private transaction makes as much sense as does the concept of a square circle. It is a logical impossibility. The patient is the one who has the contract with the insurer. The insurer is obligated to pay what his contract says he will pay. The physician has a contract with the patient to provide that patient with the best care he is capable of providing.

Government, of course, has a variety of options for controlling physicians. Those on salary have their salaries fixed. Those who work fee-for-service but bill government, find their fees fixed or lagging behind inflation, their payments delayed pending investigation of claims, and some payments withheld. Those who charge their patients directly and who refuse government payments find some patients' claims slow in being paid, some not paid at all, or patients are asked to refund moneys which government alleges had been paid out in error (sound familiar?).

How do we, the practicing physicians, survive in this bureaucratic morass? To do so requires courage and determination to be true to ourselves. Our concern should be the practice of high-quality medical care. The government's concern is cost containment. In my opinion, those two statements must be kept in mind by all of us every day that we practice. It is truly a paradox. Government knows they cannot establish an implement in a National Health Insurance Program with ever-escalating health care costs. So they have, to a large extent, maneuvered the medical profession into accepting responsibility for these ever-escalating health care costs and then demanded the private practicing physician do something about bringing down the costs so that government will be able to implement NHI.

What can you and I do? Government in a democracy can only control the physicians through money. It cannot control the quality of their work. To stay out of government control, we must become truly private practitioners. We must render our services to each patient as an individual and look to that patient alone

for payment. We must decide our own worth and contract with our patients on that basis. We must take the economic risk that is inherent in this position. If we sincerely believe that private medicine is better than state-controlled medicine, if we want the freedom for our patients to choose private medicine and the freedom for ourselves to practice top-quality medicine without government regulations or control, we have no other choice. If we explain this to our patients and then stand firm to our principle, we can survive. The only effective obstacle to government control of medical practice is insistence on direct payment by our patients, letting them know ahead of time that their contract with the third party is their business. Our contract is strictly with the patient. It won't be easy. Securing and maintaining feedom never has been.



C. A. Anderson, M.D.
President

MMA 1978 Annual Meeting, Duluth, Minnesota

Evaluation and Management of the Hypertensive Patient

3 credit hours — Thursday, May 11

Hypertension is a problem commonly encountered by the practicing physician. Demonstrations of therapeutic efficacy in this disorder have created new priorities in this area. The needs of recognizing, properly managing, and following the large numbers of hypertensive patients have assumed major importance in recent years. This postgraduate course is designed for the practicing physician. Understanding the basic pathophysiological mechanisms of hypertension, establishing the diagnosis and severity of hypertension, assessing the need for treatment, proper treatment using both pharmacologic and non-pharmacologic means, and criteria for excluding causes of secondary hypertension will be emphasized. A panel discussion will provide an opportunity for the registrants to address questions to the faculty. Physicians completing the course should be well prepared to thoroughly understand the hypertensive disease process and to effectively evaluate hypertensive patients, properly use available diagnostic modalities, and optimally manage their patients with hypertension.

Psychotropic Drugs

3 credit hours — Thursday, May 11

A program for the primary care physician concentrating on three topics for presentation and discussion: Cross-physical and cross-psychological tolerance between psycho-active drugs (including alcohol), hypnosis and sedatives, and outpatient treatment with anti-psychotics.

Dizziness — A Panel Discussion

3 credit hours — Friday, May 12

This course will present a panel of specialists dealing with the topic of vertigo. The physician who takes this course will be better versed in the multidisciplined approach to the dizzy patient and have an understanding of the diagnosis and treatment.

Editor's Notebook

A Matter of Balance

"Medicine is a huge, illimitable world teeming not only with facts but also with ideas."
Sir Theodore Fox
Crisis in Communication: The Functions
and Future of Medical Journals.
The Athlone Press, 1965

"You don't fix it unless it is broke."
Bert Lance, 1977

Every two years or so we poll our readers to find if you approve of the way we are running MINNESOTA MEDICINE. In our last poll in August 1975, we learned: (1) 70 percent of you read at least half of the articles; (2) you prefer to read these features: scientific articles 77 percent, Editor's Notebook 67 percent, President's Letter 58 percent, and Special Articles 58 percent); and (3) you have strong opinions and don't hesitate to suggest changes.

In an editorial on the last questionnaire* I responded to your suggestions. I would like to do so again in our new questionnaire. This new questionnaire, which appears on the next page, also has a blank space for opinions and suggestions. I invite you to fire away at the blanks (mind you, I am not asking you to shoot blanks), if you harbor strong opinions about the journal.

After you have responded to our poll, we will gather the data and present them to our next Board of Editor's meeting, scheduled in late April, 1978. The Board, in turn, will sift through the data and formulate a few policy decisions. We will then present the poll results and our Board's decisions to the Council and House of Delegates at the Minnesota Medical Association Meeting in May.

In considering how to answer the questionnaire, I hope you will pay particular attention to a matter of balance. What, to be specific, should the balance be between clinical and nonclinical pages? As you probably know, the Editors, myself especially, have tilted the balance towards nonclinical material. Why? Because we believe we must become more knowledgeable, analytical, and thoughtful about events that occur outside medicine but influence it. No longer can medicine be concerned only with facts. Medicine also lives in a world teeming with ideas. Maybe we are wrong. If we are, we'll be glad to fix things. If we are right, we shall discreetly pursue our present course.

*Better Read Than Dead, November 1975, page 801.

For your information, here is a quick run-down on the total pages devoted to different features and subject matter in 1977:

	Total Pages for 1977	Percent of Total Page
President's Letter	25	5%
Editor's Notebook	40	8%
Clinical and Scientific Pages	343	67%
Interviews	56	10%
Political, Economic, and Social	55	10%

Is this the right mix? It's up to you to decide.



Minnesota Medical Association
Nominees for AMA Delegates and Alternates

The following members have been nominated by the Board of Trustees as AMA Delegates or Alternate Delegates and will be voted upon by the House of Delegates in Duluth at the Annual Meeting of the Minnesota Medical Association:

Delegates

Lloyd G. Bartholomew, M.D., Rochester,
Robert T. Kelly, M.D., Grand Rapids.

Alternates

Arnold Brown, M.D., Rochester,
James W. Halvorson, M.D., Zumbrota.

The report of the Nominating Committee together with biographies of all nominees for Association's offices will be published in the April issue of MINNESOTA MEDICINE.

Gillette Children's Hospital Special Issue

Because of the tremendous response for papers for this Special Issue, the Editors of MINNESOTA MEDICINE divided this issue into two parts. Part II of the Special Gillette Children's Hospital Issue will appear in the August, 1978 issue of MINNESOTA MEDICINE.

The Editors

MINNESOTA MEDICINE SURVEY

Please answer the following questions and mail this prepaid postcard to MINNESOTA MEDICINE.

1. Which of the following sections in MINNESOTA MEDICINE do you read?
   - Scientific _____
   - Editorials _____
   - President's Letter _____
   - Editor's Notebook _____
   - Interviews _____
   - Health Care Cost Commission Articles _____
   - Socioeconomic Articles _____
   - Fracture Conferences _____
   - Special Issues _____
   - Gerontology _____
   - Grand Rounds _____
   - Special Articles _____
   - Continuing Education _____
   - Laboratory Medicine _____
   - Book Reviews _____
   - History of Medicine _____

2. Which section do you read the least? _____

3. Do you think MINNESOTA MEDICINE has the proper balance between scientific and nonscientific material? Yes or No _____ .

	Too Many	Too Few
Scientific Articles	_____	_____
Interviews	_____	_____
Health Care Cost Commission articles	_____	_____
Annual Meeting	_____	_____
Socioeconomic Articles	_____	_____

4. Do you have any specific suggestions on how we might improve MINNESOTA MEDICINE?

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Back Pain in Children

ROBERT B. WINTER, M.D.* and PAUL R. LIPSCOMB, JR. M.D.†

Contrary to the adult, back pain is an uncommon complaint in children. When a child presents with back pain as the primary complaint, serious attention should be given, as significant pathology is usually found. The causes of back pain are myriad, including developmental disorders, infections, neoplasms, and congenital anomalies. Psychosomatic causes are rare.

BACK PAIN symptoms in growing children are relatively infrequent, but usually indicate a serious, recognizable entity. It is the purpose of this article to review the more common causes, to highlight the diagnostic features, and to discuss briefly the treatment.

TABLE 1

Etiology of Back Pain in Children

- A. Infection
  - 1. Pyogenic osteomyelitis and/or discitis
  - 2. Tuberculous osteomyelitis
- B. Neoplastic Conditions
  - 1. Benign
    - a. Osteoid osteoma
    - b. Benign osteoblastoma
    - c. Aneurysmal bone cyst
    - d. Eosinophilic granuloma
  - 2. Malignant Primary Tumors
    - a. Ewing's sarcoma
    - b. Osteogenic sarcoma
  - 3. Metastatic Tumors
    - a. Neuroblastoma
    - b. Wilm's Tumor
  - 4. Leukemia
  - 5. Spinal Cord Tumors
- C. Developmental Disorders
  - 1. Scheuermann's Disease
  - 2. Idiopathic Scoliosis
  - 3. Spondylolisthesis
- D. Disc Disease
  - 1. Disc Herniation
  - 2. Disc Calcification
- E. Inflammatory Disorders
  - 1. Juvenile Rheumatoid Arthritis
  - 2. Ankylosing Sypondylitis

Although the above list of etiologies is rather extensive, the clinician can, by careful history taking, a good physical examination, routine roentgenologic evaluation, and a few basic laboratory tests, arrive at a definitive diagnosis in most cases. Sophisticated and complex evaluation techniques are only rarely needed.

Infection[2–5,13–16,24,26,27,29,34]

Pyogenic Osteomyelitis and/or Discitis

The patient commonly presents with fairly localized back pain, a mildly elevated temperature, and a history

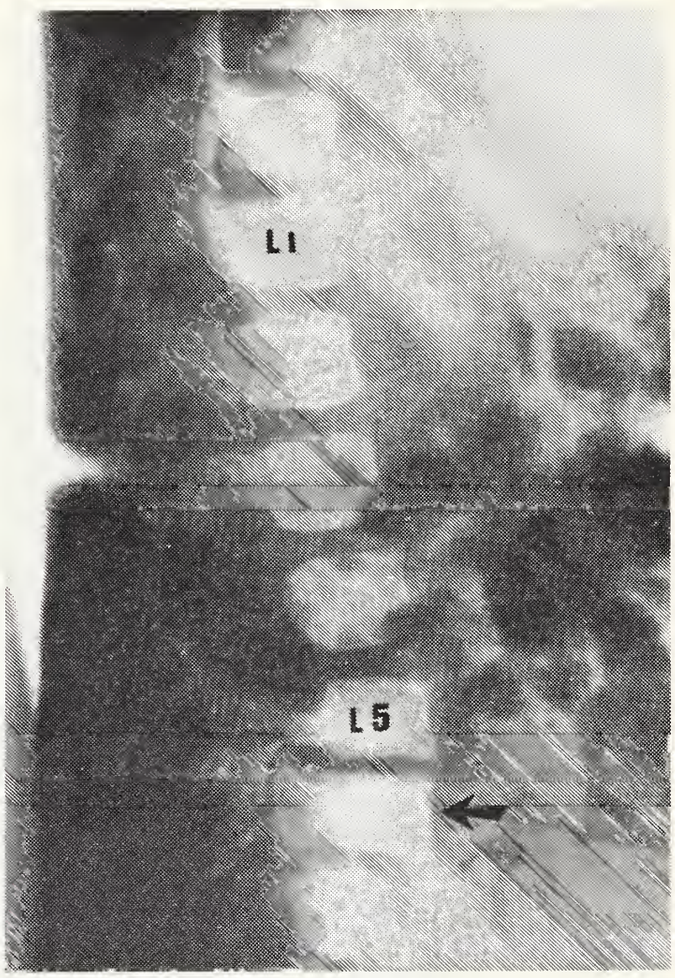


Fig. 1—Young child with pyogenic osteomyelitis of S1. Bony sclerosis and adjacent disc space narrowing is seen seven weeks after the onset of symptoms.

*Director of Medical Education and Chief, Spine Service, Gillette Children's Hospital, St. Paul and Professor of Orthopedics, University of Minnesota Hospitals, Minneapolis.
†Department of Orthopedics, Permaente Medical Center, Oakland, California.

of some febrile illness, e.g., sore throat, ear ache, a week or two previously, Physical examination will demonstrate localized bone tenderness, and rather widespread paravertebral muscle spasm. Limitation of back motion is very characteristic. The young child will quite often refuse to walk. The neurologic examination is normal.

Routine laboratory tests will show a significant elevation of the sedimentation rate (50-100 mm/hr.). The white blood cell count is elevated in only 25% of cases, while the differential is abnormal in about 65% of cases. Blood cultures should be obtained as it is the only way to easily obtain the offending organism.

Roentgenograms should be obtained, but will be entirely normal early in the condition. At this stage, bone scans (Gallium 67 or Technetium^{99} Polyphosphate) are extremely useful in achieving a diagnosis. Later, the films will show disc space narrowing and irregularity of one or both vertebral end plates (Figure 1).

In the past, there has been a tendency to distinguish two separate entities, vertebral body osteomyelitis, and "non-infectious discitis". Recent studies by Bobechko, et. al.,[4] have shown this separation to probably be erroneous. Both conditions are of infectious origin, usual Staphylococcal, and should be treated as such. The ideal situation is early detection by history and physical examination, confirmation by bone scan, bacteriologic diagnosis by blood culture, and treatment by bedrest and appropriate antibiotics. Diagnosis by needle aspiration is probably not indicated except in refractory or unusual cases.

Tuberculous Osteomyelitis

Although its incidence is markedly reduced, tuberculous spinal infection can still be seen in the United States. The spine is the most common site of skeletal involvement. It is usually seen in children age three to ten who have close contact with an infectious adult.

The onset is insidious with pain and stiffness in the back. There is malaise, anorexia, weight loss, and low grade fever. A localized kyphosis may be the first objective sign. The prominence is tender, and there is protective muscle spasm. The sedimentation rate is elevated, but the white count and differential are normal. The bone scan is positive. A tuberculin skin test is positive. Routine roentgenograms show haziness and loss of trabecular pattern in the vertebral body. There is an adjacent fusiform paravertebral shadow. Chest roentgenograms commonly show a primary focus.

Treatment consists of immobilization of the spine by a cast or brace plus double or triple drug chemotherapy. Surgical excision of the abcess plus spine fusion is indicated in those cases with vertebral collapse. The early case without vertebrae collapse will usually respond to drugs and immobilization only (Figure 2).

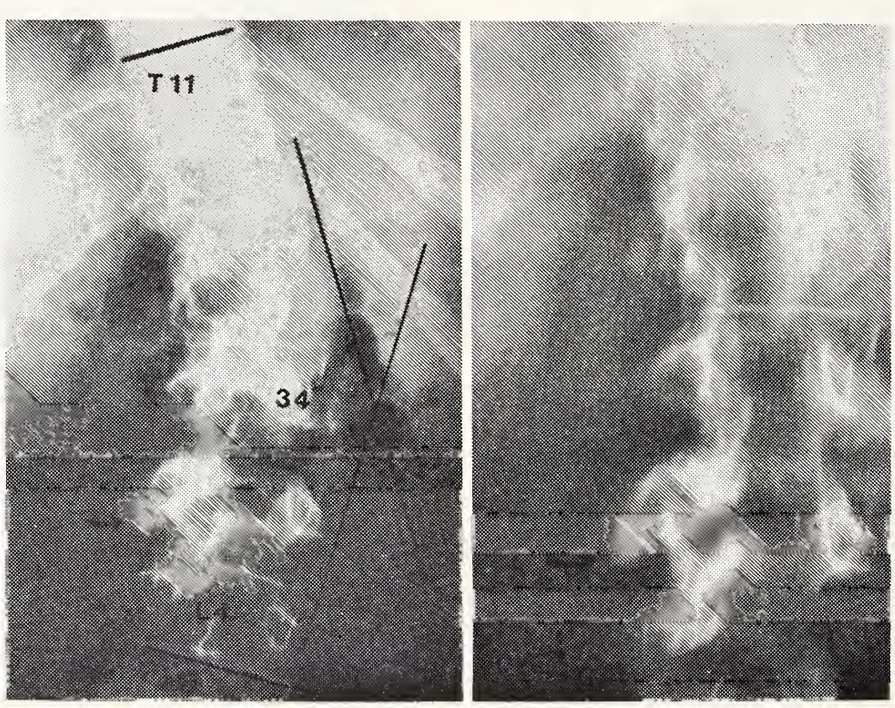


Fig. 2—Adolescent male with osteoid osteoma in the left posterior elements of L3 causing a right convex curve. The central nidus with surrounding bony sclerosis is better seen in the tomograms.

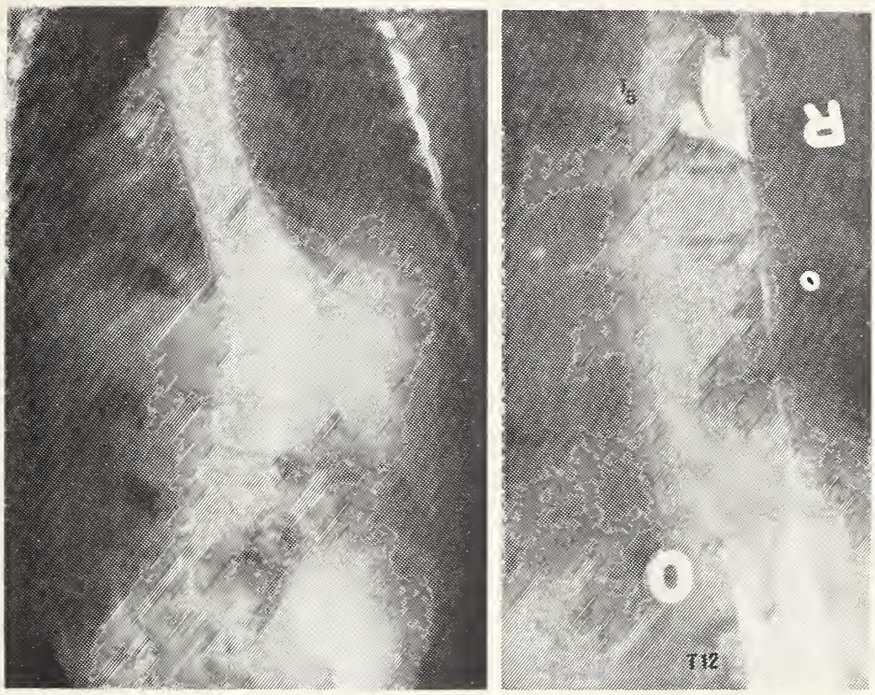


Fig. 3—This four year old girl was treated with bracing for 1½ years for idiopathic scoliosis. The development of left leg pain and decreased ankle jerk led to a myelogram which revealed a classic intramedullary lesion consistent with the diagnosis of astrocytoma.

Neoplastic Conditions

Benign Osteoid Osteoma[8,11,28]

This peculiar lesion is a neoformation representing neither an inflammation nor an infectious condition. It is characteristically painful and ninety percent are found between the ages of five and twenty-five. The lesion is almost always in the posterior elements of the vertebra on one side, e.g., in the region of the facet joint and pedicle. It is most commonly in the upper lumbar spine, Histologically, a nidus of highly vascular connective tissue matrix is seen with varying amounts of osteoid tissue and irregular trabeculae of immature bone. This tiny nidus is surrounded by dense, sclerotic bone. The pain is peculiarly responsive to aspirin. A scoliosis is customarily seen, concave to the side of the lesion, with the apex at the site of the lesion.

Routine roentgenograms of good quality will usually show the lesion. Bone scans are quite helpful and tomograms may be necessary to pinpoint the lesion.

Treatment is by surgical excision of the nidus. Intraoperative roentgenograms are critical for the proper identification of the lesion (Figure 3).

Benign Osteoblastoma[8,28]

This is a rather rare bone lesion. It resembles osteoid osteoma in having a highly vascular matrix with much

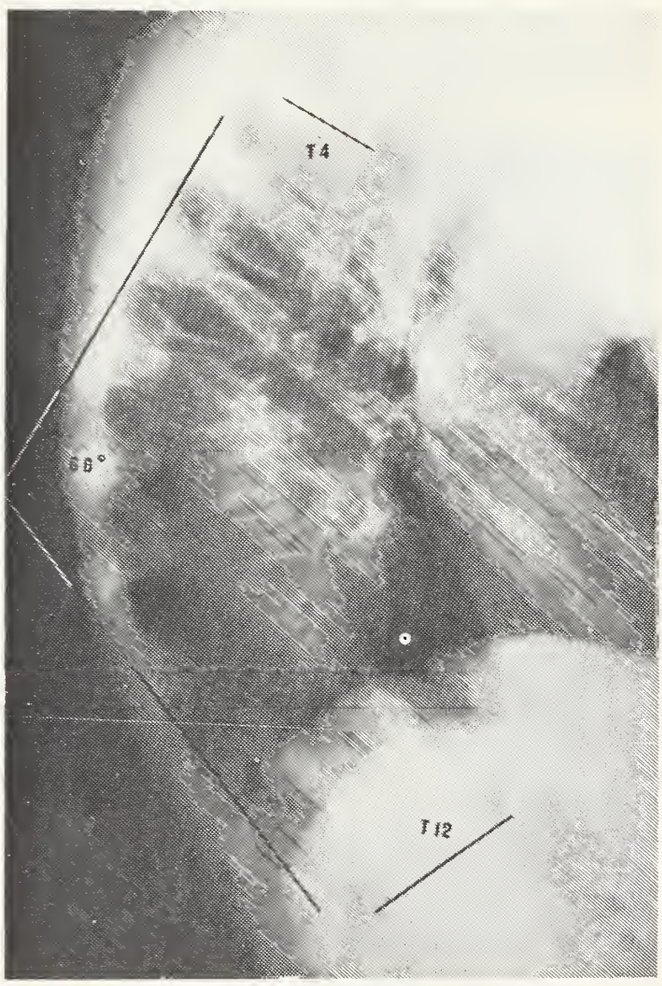


Fig. 4—Sixteen year old male with Scheuermann's kyphosis of 66°. There is vertebral wedging of T6-9 and multiple irregular end plates.

osteoid tissue, but is much larger. It expands and destroys the involved bone but is surrounded by a shell of cortical new bone. Paralysis may occur by intrusion into the spinal canal. Treatment is by local surgical excision.

Aneurysmal Bone Cyst[8,28]

This benign lesion is of unknown etiology. It is most common between age ten and twenty, and is equal in male and female. Contrary to osteoid osteoma, aneurysmal bone cysts more often involve the vertebral body. It may extend into the spinal canal and cause neurologic symptoms. Early there is a purely lytic lesion in the vertebral body. As it expands beyond the vertebral body, there is a shell of bone at the margin of the tumor.

Eosinophilic Granuloma[8,28]

This is a tumor-like condition representing the mildest of the three forms of histocytosis. It is more common in males and most frequently seen between four and twelve years of age. The usual clinical problem is localized back pain and muscle splinting. Routine roentgenograms show a lytic lesion in the vertebral body with vertebral body collapse. The discs are normal. There is no paravertebral shadow. Treatment is by bracing until non-symptomatic. Irradiation, commonly given in the past, is not indicated. Remarkable reconstitution of vertebral body height may occur, particularly if the child is young.

Malignant Primary Tumors

Malignant primary vertebral sarcomas are quite rare in children. Both Ewing's tumor and osteogenic sarcoma are recognized. Patients with Ewing's sarcoma may have elevated temperature and white blood count and can thus closely mimic osteomyelitis. Osteogenic sarcoma may be primary but is just as common as a secondary tumor in previously irradiated areas (Figure 4).

Metastatic Tumors

In children, the most common tumors metastatic to the vertebrae are neuroblastoma and Wilm's tumor. Back pain may be the presenting complaint. Neuroblastoma may present as a paraplegia due to extra dural intraspinal spread. Laboratory diagnosis of neuroblastoma is possible due to increased catecholamines and their metabolites in the urine.

Leukemia

Vague bone pain, frequently in the back, is a common early symptom of leukemia. Bone pain is



Fig. 5—Sixteen year old male with asymptomatic Grade I spondylolisthesis.

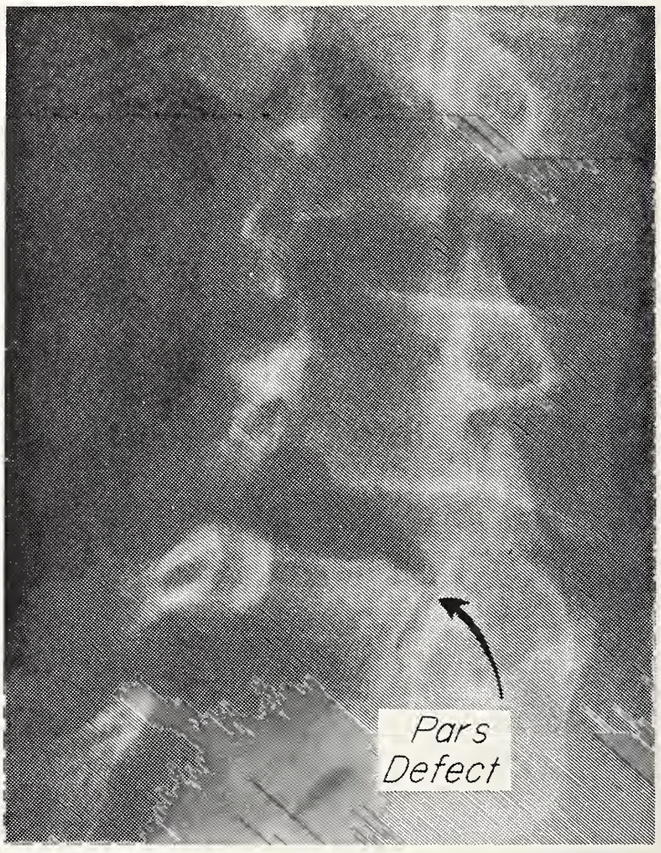


Fig. 6—In spondylolysis the radiolucent defect through the pars interarticularis is seen with 45° oblique views.

especially common in acute leukemia, the type most often seen in children. Physical examination should therefore include all lymph nodes, the liver for hepatomegaly and the spleen for splenomegaly. Blood and bone marrow smears confirm the diagnosis.

Spinal Cord Tumors[22,32]

Intraspinal tumor must be considered in young children who complain of recurrent pain of consistent location. They are most common in children under age four. There are the malignant group of gliomas (e.g., astrocytoma) and the benign developmental tumors, such as dermoid cysts, lipomas, and intramedullary cysts.

Careful diagnostic attention should be directed toward subtle gait alteration, limps, leg or arm weakness and neurologic findings such as hyperreflexia and positive Babinski's Limp are usually present before back pain. Bowel and bladder function is frequently altered.

Roentgenograms of the whole spine should be obtained and examined especially for widening of the spinal canal. Scoliosis may be due to cord tumor.

Definitive diagnosis depends upon a high index of suspicion careful neurologic evaluation, and examination of the spinal fluid. Myelography should be done, preferably at the time of the spinal tap.

The treatment is neurosurgical. Extensive ongoing urologic and musculoskeletal problems may require complex specialist management (Figure 5).

Developmental Disorders

Scheuermann's Disease[7]

One of the most frequent causes of back pain in the pubertal child is Scheuermann's disease. This affects males and females about equally, is commonly hereditary, is usually associated with an increased thoracic kyphosis, and is frequently confused with postural roundback. The etiology is unknown.

The patient usually complains of a mild, aching pain in the area of the increased thoracic or thoracolumbar kyphosis. Examination shows the increased kyphosis, lack of voluntary ability to correct the kyphosis. This is in distinct contrast to postural roundback which is readily correctable by the patient and which is non-painful.

Roentgenograms reveal increased thoracic kyphosis (greater than 45° on a standing lateral view), disc space narrowing, end plate irregularity, vertebral body wedging and sometimes Schmorl's nodes.

In the growing child, the kyphosis may be progressive and cause severe deformity. Treatment consists of brace application and an exercise program designed to increase thoracic extensor strength and diminish the secondary lumbar lordosis. Surgery is only rarely indicated (Figure 6).

Idiopathic Scoliosis[23]

Idiopathic scoliosis is common in the pubertal and young adolescent child. It is only rarely painful in the child. Pain is so uncommon that a painful scoliosis in a twelve year old is highly suspect of being due to a spinal cord tumor or an osteoid osteoma.

Spondylolisthesis[9,12,19,20,30,33,35–37]

The term spondylolisthesis means a slipping of one vertebra on another. This problem is relatively common in children, probably being the single most common cause of back pain in the growing individual. The most common area of slip is at the fifth lumbar vertebra. In a child, the slip is due to congenital defects in development of the L5-S1 facet joints, elongation of the pars interarticularis, or a lytic defect in the pars. Of these three, the lytic defect is the most common. These lytic defects are not present at birth, but appear at about age five. The cause is unknown, but probably represents a stress or fatigue fracture.

About 5% of North American children over age six have these lytic defects, but only a few develop symptoms or slipping. Up to 30% of adolescent gymnasts exhibit these lytic defects.

The usual patient is a young teenager presenting with low back pain and increased lumbar lordosis. The hamstrings are quite often tight, limiting the straight leg raising test bilaterally. There is distinct tenderness at L5-S1.

Routine lumbar roentgenograms should include a standing lateral view, a supine anteroposterior view, and oblique views of the lumbosacral area to detect the defect in the pars interarticularis.

Various degrees of slip can be present, ranging from none to complete dislocation of L5 and S1. Generally speaking, the severity of slip correlates with the severity of symptoms.

Treatment depends upon the symptomatology and severity of slip. All slips of 50% or greater in growing children should be fused. If there is objective evidence of nerve root compression, the root should be decompressed in addition to doing the fusion. Slips of less than 50% but with persistent and disabling back pain should also be fused. Minimally symptomatic slips of less than 50% need not be fused but are treated symptomatically with reduction of activity and external support (Figure 7).

Disc Diseases

A Disc Herniation[4,6,17]

Disc herniation is rarely seen prior to age ten but must be considered in patients with back pain. The child's signs and symptoms of back pain or sciatica are similar to those of the adult. The onset of symptoms is less dramatic in a child, and recumbency usually gives better relief.

Coughing and sneezing may increase the pain while local tenderness is inconstant. Muscle spasm causes splinting, scoliosis, and gait disturbance but seldom objective neurologic loss. Plain roentgenograms demonstrate decreased lumbar lordosis and scoliosis. As in the adult, L4-L5, and L5-S1 levels are by far the most common. Conservative treatment is sometimes successful and surgical excision is reserved for conservative failures. A preoperative myelogram is essential to establish the diagnosis and determine the level of herniation. Spinal fusion after hemilaminectomy is not necessary.

Disc Calcification[10,25]

Disc space calcification is a distinct clinical syndrome of uncertain etiology which is occasionally seen in children's cervical spines. Boys are affected twice as often as girls, commonly around seven years of age. The child presents with pain and stiffness of the neck and may have local tenderness and torticollis as well. There is often evidence of inflammation with an elevated temperature, increased sedimentation rate, and leukocytosis. Roentgenograms do not demonstrate the calcification for days to weeks after the onset of symptoms but will then reveal calcific opacification centrally in the nucleus pulpous of one or more discs in the lower cervical spine. Treatment is symptomatic including a neck collar, traction, and mild analgesics as this condition runs a self-limited course with a consistently good prognosis. Most patients are symptom free after several weeks but intermittent neck pains may persist for one to two years. The calcification as well regressses and disappears with time.

Inflammatory Disorders

Juvenile Rheumatoid Arthritis[1]

Persistent back pain with or without peripheral arthritis can represent the early symptoms of a non-specific inflammatory disorder. Neck stiffness and pain are suggestive of juvenile rheumatoid arthritis which has cervical spine involvement in about half the patients, usually those with polyarticular disease. Fatigue and morning stiffness may be prominent complaints while fever, rash, leukocytosis, and elevated sedimentation rate may be prominent features. The subsequent course of the disease parallels rheumatoid arthritis in the adult.



Fig. 7—Eleven year old female with Grade III spondylolisthesis prior to lateral mass fusion from L4 to S1.

Ankylosing Spondylitis[21]

Enduring pain in the lower back with or without peripheral arthritis may be the harbinger of ankylosing spondylitis. Usually a disease of young and middle-aged adults, it can begin in males as young as six years of age. Stiffness and pain in the back with involvement of the sacroiliac joints and variable progression to the joints of the lumbodorsal and cervical spine is characteristic. About half the patients also develop a transient arthritis of the larger peripheral joints. Common features include an asymmetrical joint distribution, exacerbation of the pain at night, decreased chest expansion, a predilection for males and a significant familial incidence. Systemic features include a low grade fever, anemia, anorexia, fatigability, and growth retardation. Laboratory studies are not specific although a greatly increased frequency of W27 HL-A antigen is found. Roentgenographic findings are

absent during the early course of the disease. Although involvement of the sacroiliac joints appear first and is necessary for the diagnosis of ankylosing spondylitis, this takes three to four years to appear. Progression of joint destruction to the vertebrae takes even longer.

Summary

In infancy and childhood, back and neck pain are uncommon but when they occur they must be taken seriously as the underlying cause will nearly always be found to be serious. The differential possibilities of the pain are varied and intriguing but seldom psychosomatic. Most local spinal pain is secondary to involvement of the vertebra and ligamentous structures with secondary spasm of paravertebral muscles. Other possibilities are arthritis, disc disease, and meningeal and spinal cord disorders. A thorough examination including accurate neurological evaluation and careful roentgenographic study are essential in evaluating the child who cannot verbalize his complaints well.

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Minnesota Medical Association Auxiliary
"Helping Keep Your Child Safe from Disease"

"Helping Keep Your Child Safe From Disease" is the title of an immunization pamphlet recently developed by the Minnesota Medical Association Auxiliary, in cooperation with Doctor Walter Wilder, Chairman of the Child Health Committee. This pamphlet is designed for distribution through physicians' offices to expectant parents and includes a schedule for immunization of normal infants as recommended by the American Academy of Pediatrics/Minnesota Department of Health.

The March NEWSPAGE will include a sample copy of the pamphlet and quantity price list. For further information, contact the MMA Auxiliary office, 101 East 5th Street, Suite 900, St. Paul, Minnesota 55101.

Minnesota Medical Association
Membership Biographical Records

Recently the State Office sent to each member a membership biographical record form. Early completion and return of this form to the State Office is essential to effectively utilize the new IBM Office Systems 6 word/data processor. The State Office urgently requests your cooperation in returning the form.

Hip Disease in Children

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In children, disease in the hips may be caused by a multitude of conditions. In most conditions, catastrophic disabilities can be avoided by early diagnosis and prompt administration of the appropriate treatment. In this article, some of the important points to look for in taking a history for a suspected hip problem as well as the physical, roentgenographic and laboratory examination of the hip are summarized. Five important conditions are discussed in more detail. These include: acute suppurative arthritis, congenital hip dislocation, Legg Perthes' disease, transient synovitis and slipped capital femoral epiphysis. Emphasis is placed on principles of diagnosis and treatment rather than technical details.

HIP DISEASE in the pediatric patient is a common problem. Often times their presentation is rather subtle or misleading. It is these that provide the physician with special challenge. In most conditions, early administration of the appropriate treatment could lead to preservation of a normal hip. More catastrophic disabilities are caused by delay in diagnosis than by administration of inappropriate treatment.

Referred pain in the knee is one of the main contributors to delayed diagnosis. Other patients may

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TABLE 1
Differential Diagnosis of Hip Disease in Children

- I. Traumatic
  - A. Fractures and dislocations
  - B. Slipped capital femoral epiphysis
- II. Congenital
  - A. Congenital hip dislocation
  - B. Proximal femoral deficiency
  - C. Coxa Vara
- III. Inflammatory
  - A. Transient synovitis
  - B. Rheumatoid arthritis
  - C. Rheumatic fever
  - D. Lupus erythematosis
  - E. Psoriasis
  - F. Erythema Nodosum
  - G. Polymyositis
  - H. Dermatomyositis
  - I. Serum sickness
- IV. Infectious
  - A. Suppurative
  - B. Tuberculus
  - C. Gonococcal
  - D. Syphilitic
  - E. Viral
- V. Vascular
  - A. Legg-Perthes' disease
  - B. Avascular necrosis associated with known disease entities
    1. Sickle cell disease
    2. Gauche's disease
    3. Casson's disease
  - C. Osteochondritis dissicans
- VI. Neuromuscular
  - A. Poliomyelitis
  - B. Cerebral Palsy
  - C. Myelodysplasia
- VII. Metabolic
  - A. Hemophilia
  - B. Mucopolysaccharidoses
  - C. Rickets
  - D. Scurvy
- III. Tumor and tumor-like condition
  - A. Malignant
    1. Osteogenic sarcoma
    2. Giant cell tumor
    3. Ewing's sarcoma
    4. Leukemia
    5. Synovioma
  - B. Benign
    1. Osteoid osteoma
    2. Pigmented villanodular synovitis
    3. Chondroblastoma
    4. Unicameral bone cyst
    5. Aneurysmal bone cyst
- IX. Developmental
  - A. Multiple epiphyseal dysplasia
  - B. Spondyloepiphyseal and spondylometophyseal dysplasia
  - C. Dwarfism
    1. Diastrophic
    2. Achondroplastic
  - D. Juvenile idiopathic osteoporosis

present with a limp without pain. Hip diseases may be primary or isolated conditions or they may be part of generalized diseases or syndromes. A list of the differential diagnosis is presented in Table 1.

A logical and systematic approach is necessary in assessing a child with a suspected hip problem. Obviously this should start with a detailed history and physical examination.

History

The age of the patient is important. Frequently, once the complaint is localized to the hip, a good educated guess can be made as to the diagnosis. The commonest hip problem in infants is congenital dislocation. Legg-Perthes' disease and transient synovitis are the most common hip diseases in juvenile patients while slipped capital femoral epiphysis is the most important hip problem to recognize in adolescent patients.

The duration of the complaint and any history of trauma should be obtained in the history. The progression of symptoms should be closely recorded. If pain is present, its character, radiation, and relation with activity or diurnal variation should be recorded. The presence of fever indicates an inflammatory process.

The family history is important because many hip diseases have hereditary or familial predisposition. A detailed functional inquiry will often provide important clues. Sometimes these could almost be diagnostic. A recent history of streptococcal upper respiratory infection associated with fleeting arthralgia should alert the physician to rheumatic fever. If the child complains of hip pain at night, best relieved by aspirin, osteoid osteoma should be suspected. If hip pain is associated with generalized malaise, fever and iridocyclitis and a macular rash one should obviously investigate for rheumatoid arthritis. Exposure to tuberculosis should make one suspect a tuberculous synovitis.

Physical Examination

Compared to the more peripheral joints, the hip is rather deeply situated rendering the examination of the joint more difficult. Signs of inflammation, such as, swelling, redness, warmth, and tenderness, may be hard to detect in hip disease. One should palpate for tenderness both anteriorly and posteriorly.

Limitation of motion is the most frequently positive finding on physical examination. The motion in flexion-extension, adduction-abduction, and internal-external rotation should be recorded accurately. Maximal relaxation of the capsule of the hip joint occurs with the hip in flexion, abduction and external rotation and so children will tend to keep their hips in that position if there is capsular distension. True hip flexion contracture can only be observed after the pelvis is locked by flexion of the contralateral hip (Thomas Test). In the presence of chemical irritation, e.g., in cerebral palsy, or bony abnormality, e.g., limitation of abduction in congenital coxa vara.

The gait pattern should be observed closely. When a patient limps because of pain, he tries to bear weight on the painful extremity for as short a time interval as possible (Antalgic gait). In contrast, patients with hip disease may limp because of abductor muscle weakness. In such instances they have to shift their center of gravity to the affected side with every step so as to decrease the demand on the abductors (Trendelenberg gait).

The Trendelenberg test should be done to demonstrate abductor weakness. On one-legged stance, the pelvis is kept level by contraction of the abductor muscles on the ipsilateral side. In the presence of abductor weakness the pelvis will sag or the patient will try to maintain balance by shifting the center of gravity over to the weight bearing extremity (positive Trendelenberg test). A stress Trendelenberg test can be done to demonstrate minimal, abductor weakness by asking the patient to jump on lower extremity so as to accentuate the demand on the hip abductors, or to stand on one lower extremity for prolonged periods of time, e.g., 30 seconds.

Examination of other parts of the patient will often provide very important clues. The presence of excessive lethargy, irritability, anemia and poor nutritional status will often suggest a systemic disease. Hip deformity may only be one of the many deformities present on a generalized disease process. For example, the presence of hip deformity, hitchhiker's thumb, club feet, spinal deformity and disproportionate short limb would help one to make a diagnosis of diastrophic dwarfism. A careful neurological exam must be done in neuromuscular diseases such as cerebral palsy.

The clinical signs of a few of the more important diseases will be dealt with in more detail separately in the latter part of the article.

Laboratory Examination

In general, the laboratory examination consists of two main phases. Phase I should consist of screening tests — Xrays of the pelvis (anteroposterior and frog lateral), CBC and sedimentation rate. An obvious diagnosis may be detected from the Xray. The CBC

and sedimentation rate will give a good estimate of the inflammatory nature of the disease.

The plain roentgenogram should be examined in detail because it is often the most valuable test one can order. The diagnosis of fractures or dislocations from trauma can be made without much difficulty. The quality of bone should also be assessed carefully. Localized osteoporosis indicates long standing disuse or inflammation. Bone destruction and periosteal reaction usually indicates infection or tumor. A lytic lesion with ill-defined border, an intense periosteal reaction or rupture of the periosteum are all suggestive of a malignant process.

Based on findings on the history, physical examination and initial screening test, additional laboratory testing and roentgenographic studies may be indicated (Phase II). These are often ordered to confirm the initial diagnostic impression or to help in formulation of treatment programs. Some of the more helpful laboratory tests include the following: blood culture (in suspected septic arthritis); ASOT (in suspected rheumatic fever); coagulation studies (in suspected hemophilia or in generalized sepsis); rheumatic disease work-up such as rheumatoid factor, LE prep, antinuclear antibody, complement, immunoglobulin, HLAB27; urinary excretion of abnormal metabolites (in suspected mucopolysaccharidoses, for example).

There are numerous types of special roentgenographic studies. A detailed discussion of these is outside the scope of this paper. In general, these include special roentgenographic views, tomograms, skeletal surveys, anteriography, arthrography, and nuclear scans.

Joint aspiration and synovial fluid analysis is a very helpful diagnostic tool and is indicated in suspected septic arthritis or in inflammatory arthritis which presents as a diagnostic problem. Careful aseptic techniques must be used when aspiration is performed.

Biopsy is sometimes indicated for histological diagnosis of bone tumor or synovial diseases. The biopsy site is important. A team approach consisting of at least a pathologist, a radiologist and an orthopaedist is necessary in order to realize optimal results.

In recent years, radioisotopic scanning has emerged as a very powerful tool in the study of diseases of bones and joints. Numerous radioisotopes have been used but 99mTc Polyphosphate appears to be the most promising at this point. With this agent, high quality imaging can be obtained without subjecting the patient to a high radiation dose. Radioisotopic scanning is useful in the diagnosis and follow-up of a large variety of conditions including neoplasm, osteomyelitis, aseptic necrosis and ectopic calcification. Its main draw-back is that it is non-specific so it serves as a valuable addition to the roentgenographic examination.

Specific Disease Entities

Acute Suppurative Arthritis (Figure 1)

The hip is the most commonly involved joint in children. It is also the most vulnerable to poor results for two reasons. First, the diagnosis is often made rather late because of the deep location of the hip. Secondly, avascular necrosis is an additional complication that is unique to suppurative arthritis of the hip compared to suppurative arthritis of the other joints.[15,17,34]

The commonest presentation is fever, leukocytosis, increased sedimentation rate, acute pain and tenderness. It should always be considered as a differential diagnosis of pyrexia or septicemia or unknown origin. Neonates may not respond to suppurative arthritis of the hip with fever or leukocytosis. Therefore, suppurative arthritis should also be considered in neonates who present with failure to thrive or increased irritability.

The most important clinical signs are pain on active or passive motion. Limitation of motion with flexion, abduction, external rotation contracture, as well as tenderness may be present. The roentgenographic findings may be normal in the early phases of the disease. Subluxation or dislocation of the hip is common if the patient presents late. Bone erosion may be demonstrated on the roentgenograms as a late finding.

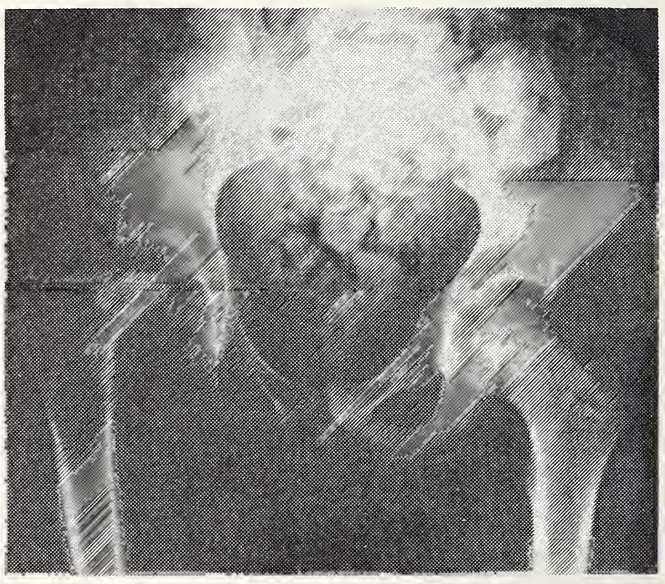


Fig. 1—Six + 5 year old after open drainage of right hip for acute suppurative arthritis. Continued to have severe pain and marked limitation of motion. The hip was eventually arthrodesed.

The commonest organism is Staphylococcus aureus.[34,35] Children six months to five years of age seem to be especially susceptible to Hemophilis Influenza. Organisms are believed to have been seeded in the hip joint via one of three routes: hematogenous, direct extension from metaphyseal osteomyelitis and iatrogenic (aspiration, arthrogram or femoral venipuncture). Therefore, femoral venipuncture should be only as a last resort for blood sampling. Cases with metaphyseal involvement have much poorer prognosis than ones without metaphyseal involvement.[34]

Prompt diagnosis and immediate administration of the appropriate treatment is imperative. Once septic arthritis of the hip is diagnosed, arthrotomy, debridement and irrigation should be done immediately.[15,17,34] In the authors' opinion, repeated needle aspiration as a form of treatment is not acceptable for septic arthritis of the hip joint. It is also imperative to obtain accurate bacteriological diagnosis so as to determine the most appropriate antibiotic treatment. However, instead of waiting for results of the culture, parenteral antibiotics in high doses should be started immediately after culture sample is taken. Since staphylococcus is the most common organism, one of the penicillins, preferably a penicillinase resistant form, e.g., Oxacillin should be used. The patient should be switched to the most appropriate antibiotics once the sensitivity results are obtained. The usual duration of treatment is from three to four weeks of parenteral antibiotics. This may or may not be followed by a course of oral antibiotic treatment. Treatment should continue at least until the sedimentation rate is back to normal and a full painless range of motion has returned, and longer if there is evidence of metaphyseal osteomyelitis.

Suction irrigation treatment is an appropriate form of treatment after open drainage. The duration varies from two days to two weeks. Prolonged suction irrigation treatment runs the risk of secondary infection. Antibiotics are sometimes added to the irrigation fluid but there is no evidence to indicate that this would improve the result of the overall treatment program.

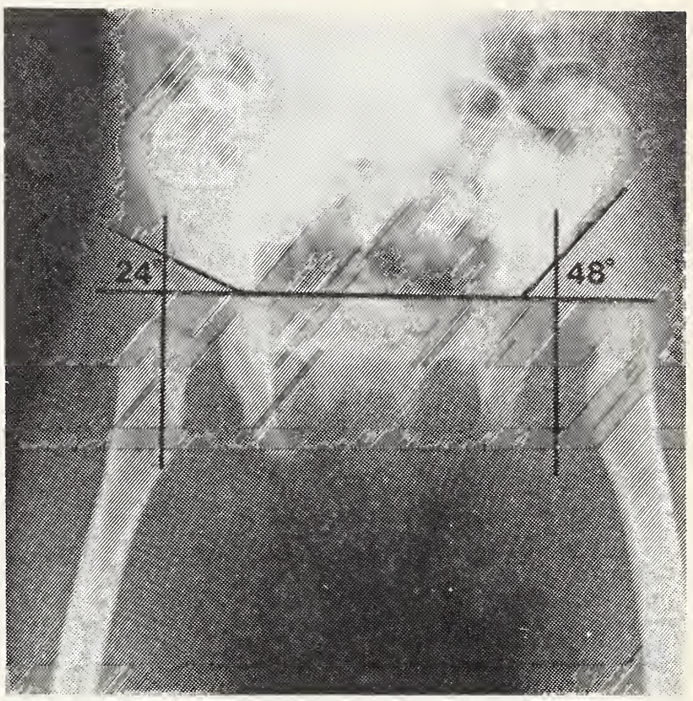


Fig. 2—One + 5 year old female with congenital dislocation of the left hip. Notice lateral and cephalad displacement of the left femur and delay in ossification of the left capital femoral epiphysis. Acetabular dysplasia is also present with an acetabular index of 48°.

Congenital Dislocation of the Hip (Figure 2)

Congenital hip disease is one of the most common congenital malformations. Depending on the series, the reported incidence is between one to fifteen per thousand live births.[3,40] Females outnumber males by about four to six times.[20] The left hip is more often and more severely affected than the right.[20] The incidence is increased ten times after breech delivery.[21] The etiology is unknown.

The literature has repeatedly emphasized the need for early diagnosis. In a review of 146 cases referred to the Gillette Children's Hospital since 1960, some alarming statistics have emerged (Table 2). Close to half of the cases were diagnosed after one year of age mostly because a limp was detected when the patient started to walk. The lack of earlier diagnosis in the 1970's compared to the 1960's suggest that there is no improvement in detection, despite widespread teaching of neonatal diagnosis.

TABLE 2

Summary of Patients Referred to Gillette Children's Hospital after the Diagnosis of Congenital Hip Dislocation was Suspected or Confirmed Elsewhere.

Chronological Period	# Pts.	Diagnosis under 6 mos.	Diagnosis under 12 mos.	Diagnosis after 12 mos.
1960 - 1970	77	38 49%	44 57%	33 43%
1970 - present	69	33 48%	36 52%	33 48%

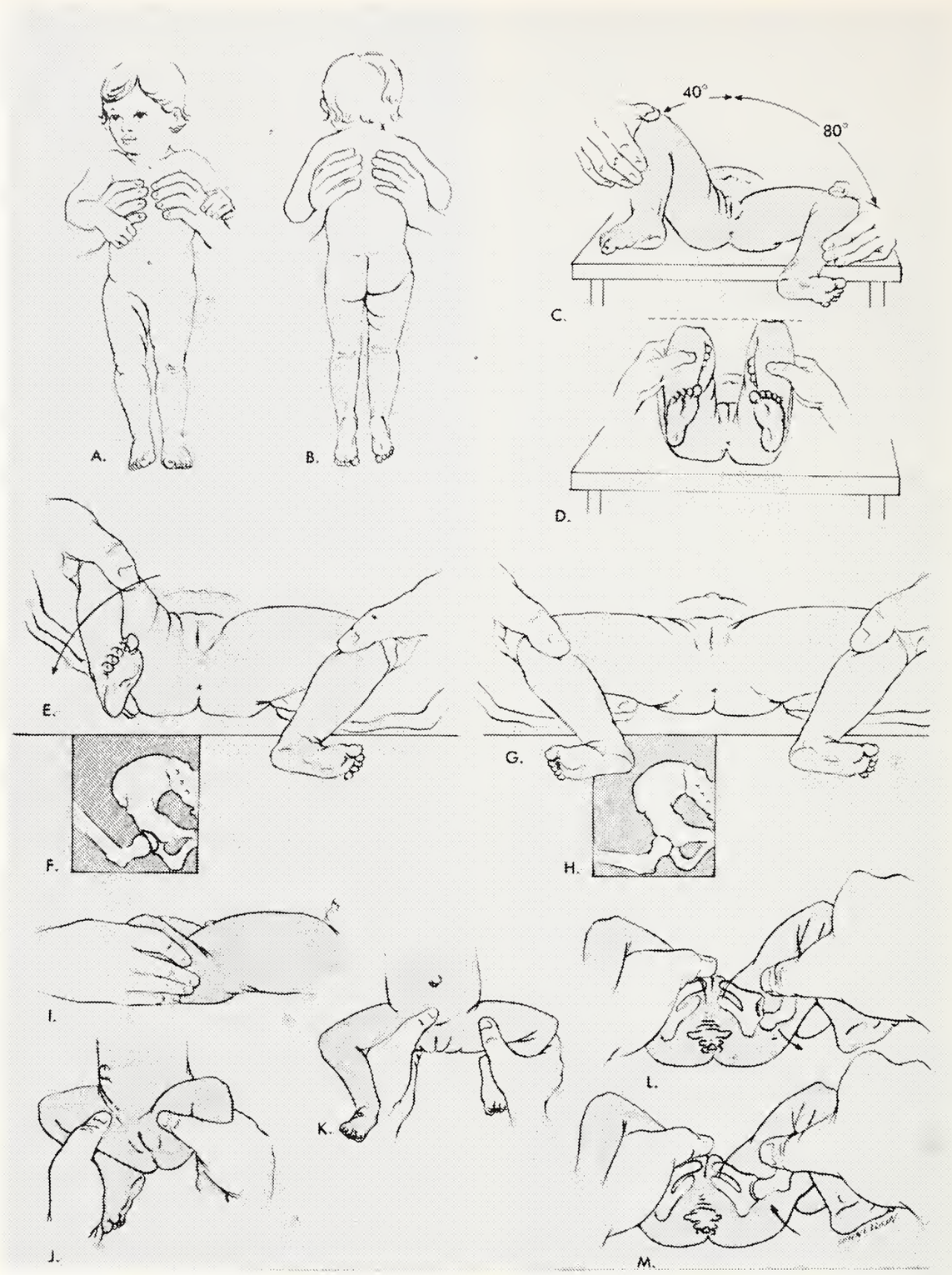


Fig. 3—Physical Findings in Congenital Dislocation of the Right Hip. (A & B) Asymmetry of the thigh folds & of the popliteal and gluteal creases with apparent shortening of the extremity on the right. (C) Limited abduction of the right hip. (D) Galeazzi's sign — apparent shortening of the femur as shown by the difference of the knee levels with the hips and knees flexed at right angles & the child lying on a film table. (E-H) Ortolani's sign — the presence of a palpable click in & out as the hip is reduced by abduction & dislocation by adduction. Note in insets (F-H) how the femoral head slides in across the posterior rim of the acetabulum and enters the socket as the hip is abducted. I-M Barlow's test for the "unstable hip". The infant lies on his back with the hips flexed to 90° & the knees flexed fully. (I-J) shows the position of the long finger of each hand over the greater trochanter & of the thumb opposite the lesser trochanter in the inner side of the upper thigh. (K) shows an alternate method used in doubtful cases. The pelvis is steadied between the thumb over the pubic & fingers under the sacrum while the hip is tested with the other hand. (L) The hips are brought into midabduction. Thumb pressure applied posteriorly over the lesser trochanter can dislocate the femoral head across the posterior lip of the acetabulum. (M) On release of the thumb pressure the femoral head slips back into the acetabular socket, indicating that the hip is "unstable — not dislocated, but dislocatable". (Pediatric Orthopedics, Fig. 2-34, p. 136, Edited by M. O. Tachdjian, Published by W. B. Saunders Company. By Permission)

Screening for congenital hip disease *must* be done in the new born nursery. Most neonates with congenital hip disease usually have a reducible dislocation at birth. The hip is lax and easily dislocatable but not fixed in the dislocated position. Clinical diagnosis is made by demonstration of the dislocation potential of the hip.[3,9] It is impossible to predict the fate of these hips. They may progress to a normal hip without treatment, or progress to dislocation. If true dislocation is present, the Ortolani ''click'' of reduction usually can be demonstrated.

Asymmetrical thigh folds may be present but this is an unreliable sign since fifty percent of normal infants have asymmetrical thigh folds. Tight adductors are *not* present in the neonate. A summary physical finding in congenital dislocation of the right hip is shown in Figure 3.

In the late neonate (older than eight weeks) with congenital hip disease, subluxation or dislocation is often present.[50] In these children, soft tissue contracture, especially that of the adductors, has usually developed. The most reliable clinical sign is an unequivocal adduction contracture with the hip flexed to 90°. The Ortolani sign can rarely be demonstrated at this age because there is usually enough soft tissue contractures to inhibit gentle reduction.

In older children who have started to walk, a positive Trendelenberg sign is present. In unilateral cases, the child walks with an abductor ''lurch''. In bilateral cases, the child walks with a ''duck-like'' waddle. Limitation of abduction and external rotation can often be demonstrated.

The literature is filled with publications regarding the roentgenographic diagnosis of congenital hip disease. It is important to emphasize that the diagnosis of congenital hip disease is still clinical, the Xray only serves to confirm the clinical diagnosis and assess the degree of deformity. A ''normal'' roentgenogram does not guarantee a normal hip. In the author's opinion, the more useful measurements are the center-edge angle of Weiberg[52] for measurement of lateral subluxation and the acetabular index[28] for measurement of acetabular dysplasia. The von Rosen view [39,40] is useful for assessing hips with unossified capital femoral epiphyses, usually found in neonates less than four to six months of age.

In infants less than two months of age, treatment with a commercially available splint is often adequate. Sometimes, this form of treatment can be extended to patients up to six months of age. The Pavlik harness[38] and the von Rosen splint[40] are good choices. The usual duration of treatment is three months or until the acetabular index returns to normal. Proper fitting and adjustment of these devices is important to assure maintenance of reduction. Reduction should always be confirmed by Xray after application of the splint. In order for splinting to be successful the splint must be simple to use and it must not interfere with the infant's daily needs. Frejka splints are bad because they have to be removed by the parents during each diaper change.

Congenital hip dislocation can usually be treated with closed reduction and casting up to about eighteen months of age. Forced manipulation should never be done. In patients with abduction contractures due to adductor tightness, adductor tenotomy should be done. If cephalad displacement is present, traction should be applied until the femoral head returns to the level of the acetabulum before close reduction is attempted.[14] Skin traction is usually adequate. The preferable position of immobilization is the ''human'' position (more than 90° flexion and just enough abduction to achieve stability). The physician must demonstrate that the hip is stable in the position of immobilization. Forced abduction and immobilization in the ''frog leg'' position must be avoided because this position is associated with a high rate of avascular necrosis.[1,31] If reduction cannot be obtained by closed means, an arthrogram should be done to assess the cause and surgical intervention considered.

If the diagnosis is made after eighteen months of age, closed reduction is often unsuccessful. Enough soft tissue contracture and acetabular dysplasia is likely to be present to require open reduction with or without pelvic osteotomy.[50,41] Older patients may require femoral osteotomy[50] or one of the salvage procedures in order to achieve a stable and concentric reduction.

Legg Perthes' Disease (Figure 4)

Legg Perthes' Disease is a hip disease of unknown etiology. The pathological picture is that of partial to complete avascular necrosis of the femoral head.[26] It is a self-limiting condition but with a long course (normal duration about two to four years).[16] Legg Perthes' disease is commonest in children between four and nine years of age.[45,50] The male to female ratio is about four or five to one.[7,11,45,50] About ten to fifteen percent are bilateral.[45,50] Older age at onset and more extensive quantity of involvement are related with a poor prognosis.[7]

The usual initial complaint is pain which may be referred to the knee. The patient may also appear with a painless limp.

Physical examination may reveal limitation of

motion especially internal rotation. If the patient has acute synovitis, tenderness may be elicited on palpation anteriorly. The roentgenographic appearance depends on the stage of the disease. In the initial stage, the only roentgenographic signs may be capsular distension. In the avascular stage, there may be uniform increase in density of the femoral head. In other patients the femoral head may look fragmented. Varying degrees of flattening as well as coxa magna is also common. Bi-plantar roentgenograms (AP and lateral) are important for assessment of the amount of epiphyseal involvement. Arthrography is often helpful for assessment of the true shape of the femoral head.[26,27]

Since the disease is self-limiting, the goal for treatment is prevention of deformity of the femoral head during the active phase of the disease. Historically, prolonged (one to two years) bed rest with or without traction or non-weight bearing bracing were acceptable forms of treatment to achieve this goal. The current emphasis is on containment of the femoral head within the acetabulum. At the same time, the child should be encouraged to participate in as much "normal" activity as possible so that the interference to normal psychosocial development is minimized. Short term bed rest and traction for seven to ten days is reserved for treatment of an acute episode of synovitis only.

Containment of the femoral head in the acetabulum can be achieved by one of two ways — ambulatory bracing or surgical realignment. Ambulatory braces are designed to hold the femur in abduction and internal rotation so as to gain maximum coverage.[10,19,49] Surgically, maximum coverage is obtained either by redirection of the acetabulum, e.g., Salter's Osteotomy[41,44] or redirection of the femoral head, e.g., subtrochanteric varus osteotomy.

The best form of treatment is still undecided.

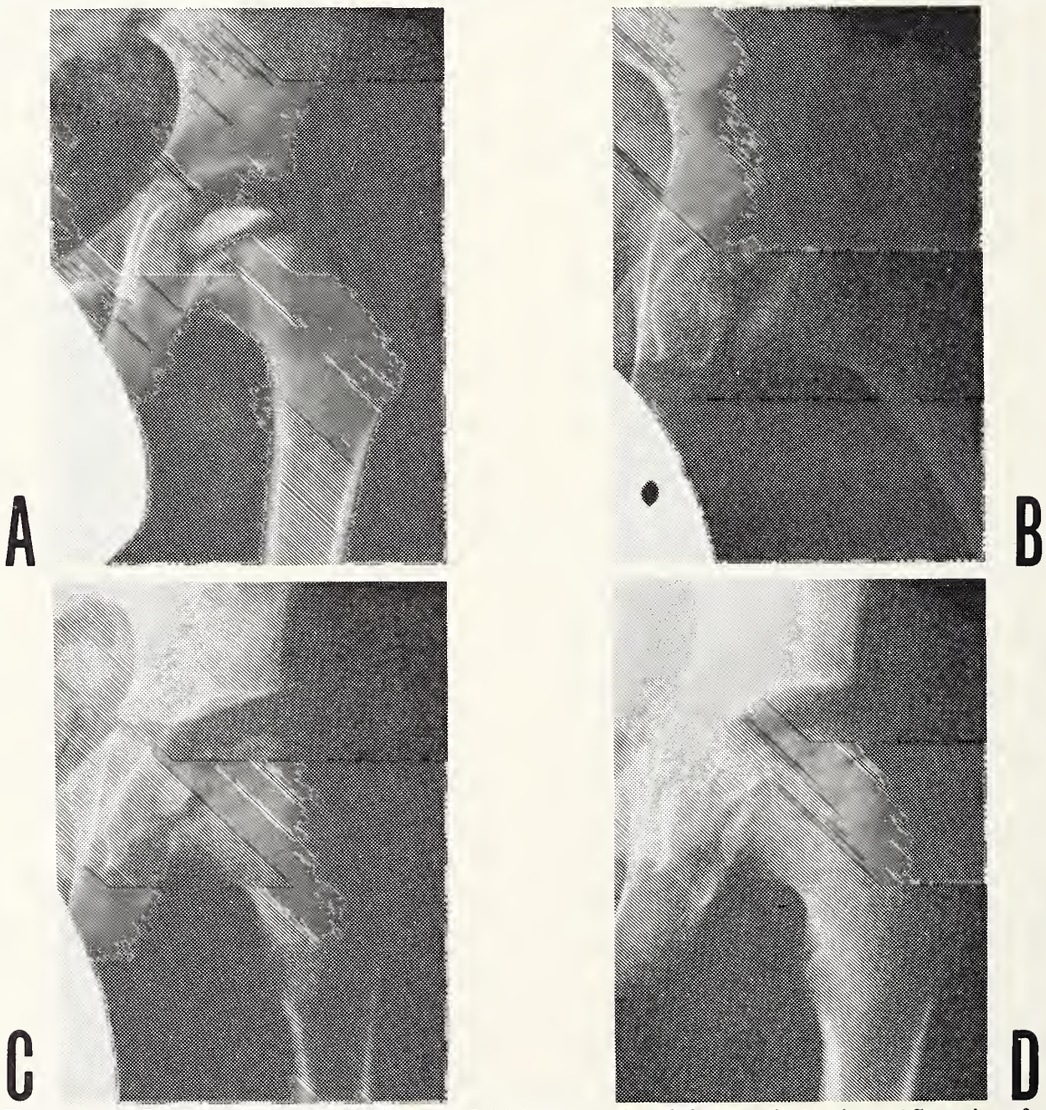


Fig. 4—Legg-Perthes' disease of the left hip (A) Initial stage — there is increase in density and flattening of the capital femoral epiphysis. Age 4+4. (B). Fragmentation stage — Age 5+2. (C) Reparative stage — Normal bone begins to appear, early coxa magna (Age 5+11). (D) Definite stage — More normal bone is seen. There is definite flattening of the femoral head with coxa magna (Age 6+6).

Surgical treatment exposes the patient to the risks inherent in any operative management. However, once the patient has recovered from the surgery, he can essentially lead a normal life and be fully active. Brace treatment avoids an operation but forces the child to wear an unsightly and limiting brace for one to two years during an important developmental stage in the early school years. Also, in order to assure the proper functioning of a brace, close follow-up by a competent orthotist is necessary.

Transient Synovitis

Transient synovitis is a common cause of hip pain in children between three to eight years of age. It is a self-limiting condition and the majority of patients will recover from it without any sequelae. However, depending on the series 1.5 to 18% of patients with an initial diagnosis of transient synovitis will eventually develop Legg-Perthes' disease.[16,24,48] The etiology is obscure. Transient synovitis is frequently preceded by an upper respiratory infection about ten days to three weeks prior to onset of hip symptoms. Males are affected one to five times more commonly than females.[48]

The usual clinical presentation is hip pain which may radiate to the knee. The child often walks with an antalgic limp. There is loss of motion with the hip typically held in flexion, abduction and external rotation. Tenderness may be elicited on palpation. A low grade temperature of 100 to 101°F is also rather common. Roentgenograms of the hip are either normal or show signs of capsular distension.

It is often difficult to differentiate transient synovitis from either Legg-Perthes' disease or septic arthritis both clinically or roentgenographically. The white blood cell count and the sedimentation rate are usually normal but occasionally may be slightly elevated. Often times joint aspiration and synovial fluid analysis is the only way to differentiate transient synovitis from septic arthritis.

This condition must be differentiated from other more serious conditions so that one does not overtreat the patient. The treatment is symptomatic. Immediate relief of weight bearing and positioning with the hip in some flexion will often provide dramatic relief in two to three days. If the synovitis is severe causing decrease in range of motion, joint aspiration is often very helpful in relieving symptoms. After relief of acute symptoms, weight bearing should be avoided from one week to ten days to prevent recurrence. It is also important to follow the patient with physical examination and hip Xray at one and three months to rule out Legg-Perthes disease.

Slipped Capital Femoral Epiphysis: (Figure 5)

Slipped capital femoral epiphysis affects children older than the previously discussed hip diseases. The peak incidence coincides with the period of maximum growth, i.e., thirteen to sixteen in boys and eleven to fourteen in girls. About 20 to 40% of the patients have bilateral involvement.[6,47,50] Boys are affected three times more frequently than girls.[50] More than half of the patients are overweight and about 25-30% have the Froelich type of body build with female fat distribution and underdevelopment of the genitalia.[6,25] Occasionally, the patient may be a slender individual with long extremities and rapid growth. The capital femoral epiphysis typically slips in the posterior and inferior direction in relation to the metaphysis. Usually the slip is gradual. In the Gillette series of eighty-nine patients between 1950 and 1965, the average duration of symptoms before diagnosis was eight months. Diagnosis made more than one year after initiation of symptoms is not uncommon. However, with a high

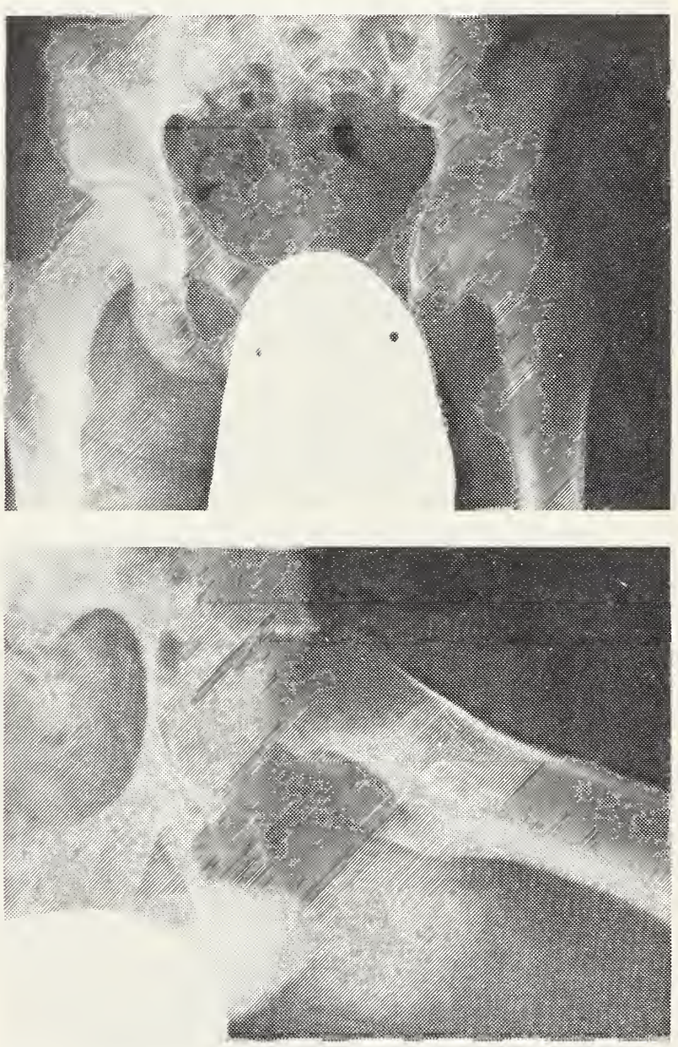


Fig. 5—15-year-old boy presented with a history of left knee pain and a limp for more than 1 year. Normal Xray of hip shows severely slipped capital femoral epiphysis. (A) Anteroposterior view (top). (B) Lateral view (bottom).

index of suspicion and careful clinical and roentgenographic examination, delayed diagnosis can be minimized. Slipping of the epiphysis may be acute in a small percentage of cases. This is usually associated with trauma.

The patients usually present with pain either in the groin and anteromedial aspect of the thigh or very frequently at the knee only. A Trendelenberg or antalgic limp can usually be demonstrated. Abduction, flexion and internal rotation of the affected hip is limited to a varying degree. Typically, as the hip is flexed, the thigh tends to ride into external rotation. Limited internal rotation with the hip flexed is also a classic finding on physical examination.

The definitive diagnosis is made by roentgenographic examination (AP and lateral). The principal roentgenographic signs are:[25] (1) Widening and irregularity of the epiphyseal plate, (2) Loss of epiphyseal hump, (3) Loss of capital epiphyseal height, (4) Inferior beaking of capital epiphysis and (5) Metaphyseal rarefaction. Often times, the lateral Xray is more revealing than the anteroposterior view[25] and so a lateral Xray is mandatory if there is any suspicion of slipped capital femoral epiphysis.

Slipped capital femoral epiphysis requires surgical treatment. Any patient with a diagnosis of slipped capital femoral epiphysis should never be allowed to leave the office walking. As there is a high rate of bilateral involvement, the opposite hip should be examined both clinically and roentgenographically. The earlier the slip is arrested, the higher the chances for a good prognosis.

Treatment should be started immediately after the diagnosis is made. Bed rest with skin traction often provides good relief of muscle spasm and allows a more realistic evaluation of range of motion.

The type of surgical treatment depends on the amount of slip as observed on the roentgenogram as well as the range of motion of the hip on clinical examination. There is no general agreement as to what are the best methods of treatment but the following can be used as a rough guideline. In minimal slip (less than one third the diameter of the femoral neck) femoral pinning or epiphysiodesis in situ is the method of choice. In severe slips, (more than two thirds diameter of the femoral neck) corrective osteotomy is advisable. This can be done at the base of the femoral neck[32,53] or at the subtrochanteric level.[47] Osteoplasty[22] with pinning or epiphysiodesis has also been done and may be most helpful in the moderate slip (one third to two thirds diameter of the femoral neck). Closed reduction is reserved only for acute slips. If manipulation is required, one must be extremely gentle with the maneuver. The epiphysis is usually pinned in situ after manipulative reduction.

Avascular necrosis[29,53] and chondrolysis[30] are the main complications of slipped capital femoral epiphysis. Patients must be followed for development of these problems after initial treatment.

Summary

Hip diseases affect children of all ages. These may be isolated conditions or part of generalized diseases or syndromes. Often times their presentation is rather subtle or misleading with referred pain to the knee and painless limp being the major contributors to delayed diagnosis. In most conditions, early diagnosis is the key to successful treatment. In order to accomplish this goal, a physician must have a high index of suspicion. He must also be familiar with the examination of hip and be prepared to order appropriate laboratory tests and roentgenograms to support his clinical impression. Screening for congenital hip disease must be done in the new born nursery. If the disease can be detected at this time, treatment is simple and a normal hip is to be expected. Acute suppurative arthritis and slipped capital femoral epiphysis are surgical emergencies. Any delay in initiation of treatment could lead to catastrophic disabilities.

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Electrical Stimulation in the Management of Incontinence in Children

C. GODEC, M.D.* and A. S. CASS, M.D.*

Incontinence in children due to a hyperreflexic bladder and/or pelvic floor weakness can be corrected by functional electrical stimulation (FES). Cystometry, electromyography of pelvic floor muscles and anal sphincter pressure measurements with and without electrical stimulation determine if FES will be successful. A success rate of 90 per cent was achieved using this method of selection. Follow-up revealed a 22 per cent relapse rate requiring further treatment with FES.

WHILE BED WETTING has controversial significance and improves with age, incontinence in the handicapped child is usually permanent, causes skin changes, and complicates social acceptance of these children. Electrical stimulation of the pelvic floor muscles has been found to control incontinence.[1–16]

This study reports the use of electrical stimulation of the anal sphincter in the management of incontinence in children with CNS disease, myelomeningocele, spinal cord injury, and "idiopathic bed wetting."

Materials and Methods

There were 45 male and 32 female children evaluated. The diseases associated with their incontinence are listed in Table 1. The sensory level with spinal cord lesions (myelomeningocele 36, spinal cord trauma 10) was cervical in one, thoracic in 10, lumbar in 17, sacral in 13 and no sensory loss in five patients. The lesions were complete in 22 and incomplete in 24 patients.

Hydrocephalus requiring a shunting procedure was present in 26 of the 36 myelomeningocele children.

Urinary incontinence was present in 73 children. Of the remaining four children, three had myelomeningocele and normal urinary continence (controls) and one had spinal cord injury with marked day frequency.

The evaluation to select children for functional electrical stimulation (FES) consisted of a cystometrogram (before and during electrical stimulation), electromyography of the pelvic floor muscles, and the anal sphincter pressure measurement (before and during electrical stimulation).[17]

The treatment with electrical stimulation was either chronic FES or by acute maximal FES. Chronic FES was applied via an anal plug with a Mentor Continaid* or a 3M Stimulator.† There was a continuous train of stimuli. The parameters of stimulation were 1 millisec. duration of single stimulus, frequency 20 Hz. and amplitude 3 to 8.5 volts (10-15 milliAmps). The patients were instructed to use the device continuously except for voiding and a pause every two hours to pass flatus. Acute maximal FES was applied via an anal plug and via stimulating needle electrodes inserted into the levator ani muscle in order to increase the input of electrical stimulation. The amplitude of stimulation was 47-50 volts (100-150 milliAmps), which was possible because of the high pain tolerance resulting

TABLE 1.
Diseases Associated with the Incontinence in Children

Myelomeningocele	36
Spinal Cord Injury	10
Cerebral Palsy	2
Post Meningitis	2
Mental Retardation	2
Encephalocele	1
Down's Syndrome	1
Poliomyelitis	1
Idiopathic Bed Wetting	22

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Supported by the Medical Education and Research Account/Foundation of Gillette Children's Hospital and St. Paul-Ramsey Hospital.

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from the sensory loss associated with spinal cord injury. The duration of each acute maximal application was 15 to 20 minutes and the applications were repeated four to 10 times with two to three days between applications.

Follow-up evaluations were performed every two weeks.

Results

Cystometrograms showed the bladder to be hyperreflexic (spastic) in 37, neurogenic with secondary changes in bladder wall (fibrotic) in 25 and normal in 15 children. A repeat CMG performed during electrical stimulation in 36 children with a hyperreflexic bladder revealed a normal tracing in nine, less spasticity in 14 and no change in 13 children. The average bladder capacity in these 36 children was 102 ml. before electrical stimulation and 167 ml. during it.

Electromyograms of the pelvic floor muscles demonstrated normal innervation in 35, slight denervation in 11, moderate denervation in 11, severe denervation in nine, and complete denervation in 11 children.

There was a rise in anal sphincter pressure with electrical stimulation of the pelvic floor muscles in 53 children; the average rise was 121 cms. water pressure from an average resting pressure of 76 cms. water to an average pressure of 197 cms. water with electrical stimulation. There was no rise in 18 children with myelomeningocele; three children with myelomeningocele were controls and three children were not tested. A comparison of the pressure rise in maximum urethral pressure and in anal sphincter pressure with electrical stimulation of the pelvic floor muscles in seven females is seen in Table 2.

The criteria for selection of children for treatment with electrical stimulation of the pelvic floor muscles were: (1) hyperreflexic (spastic) bladder function, and/or (2) pelvic floor weakness with some innervation

TABLE 2.
Pressure Rise with the Same Electrical Stimulation of the Pelvic Floor Muscles in 7 Females

Pt. #	Anal Sphincter Pressure	Urethral Pressure
45	+ 75 cm. H_2O	+16 cm. H_2O
62	+155	+15
92	+250	−10
106	+100	+10
137	+220	+26
138	+145	−34
176	+ 70	+23
Average	+145	+ 7

TABLE 3
Evaluation of Patients and Use of FES

	Myelomeningocele	Spinal Cord Injury	C.N.S. Disease and Idiopathic Bedwetters	Total
Children Evaluated	33 (+3 controls)	7	34	74
FES Indicated	12	6	33*	51*
FES Used	6	6	19	31
Inability to use	2	0	4	6
Refused	2	0	6	8
Awaiting FES Device	2	0	0	2

*Four excluded because of mental retardation (2), associated medical disease (1), transient incontinence (1.)

TABLE 4
Results and Follow-Up of Electrical Stimulation

	Myelomeningocele #	F/U (Months)	Spinal Cord Injury #	F/U (Months)	C.N.S. Disease & Idiopathic Bedwetters #	F/U (Months)	Total
Relieved*	2	12, 8®	3	20, 9, 7®	14	22, 22®, 17, 17, 17, 16®, 12, 12, 9, 6, 6, 6, 5®, 2®	19 (61%)
Improved†	3	18®, 9, 6®	2	6, 3	4	9, 7, 4, 2	9 (29%)
Failure	1		1		1		3 (10%)
TOTAL	6		6		19		31

*Dry and Off FES One Month
†Less Wet and No Further Improvement
®Then Relapsed

of the pelvic floor muscles and an anal sphincter pressure rise of > 15 cms. water with a maximum of 15 volts of electrical stimulation. The patient's cooperation was essential; any mental or physical disability interfering with the patient's cooperation or ability to manipulate the device was a contra indication to treatment with chronic FES.

The criteria for FES were absent in 22 children. There was no anal sphincter pressure rise with electrical stimulation in 18 (myelomeningocele), and a voltage above 15 volts was required to obtain an adequate pressure rise in four (myelomeningocele three, spinal cord injury one). Three myelomeningocele children were evaluated as controls. The evaluation was incomplete in one child.

The criteria for FES were present in 51 children. However, four children were excluded because of mental retardation in two, associated medical disease in one, and transient incontinence in one. Six children were unable to use the device, eight refused to use it and two are awaiting the device. Only 31 children used FES (Table 3).

The results of FES and length of follow-up are listed in Table 4. The relapse rate was 21 per cent in the 19 children cured and 22 per cent in the nine children improved. The relapse in the spinal cord injured child was treated with a repeat of acute maximal FES with cure of the symptoms. The other children with relapse are awaiting repeat treatment of FES.

Anal pain, diarrhea or excessive borborygmi were not reported by the children. Autonomic dysreflexia did not occur in any spinal cord injured child.

Discussion

Selection of children with incontinence for FES requires evaluation of bladder function and the pelvic floor musculature. Incontinence results from an abnormality in one or both of these factors. A cystometrogram evaluates bladder function and diagnoses a hyperreflexic (spastic) bladder which causes incontinence. Electromyograms of the pelvic floor muscles and the anal sphincter pressure evaluate the pelvic floor musculature and can determine if weakness is present causing incontinence.

Hyperreflexia of the bladder and pelvic floor weakness have responded to electrical stimulation of the pelvic floor muscles.[16,17] For FES to be successful an at least partially intact reflex arc must be present

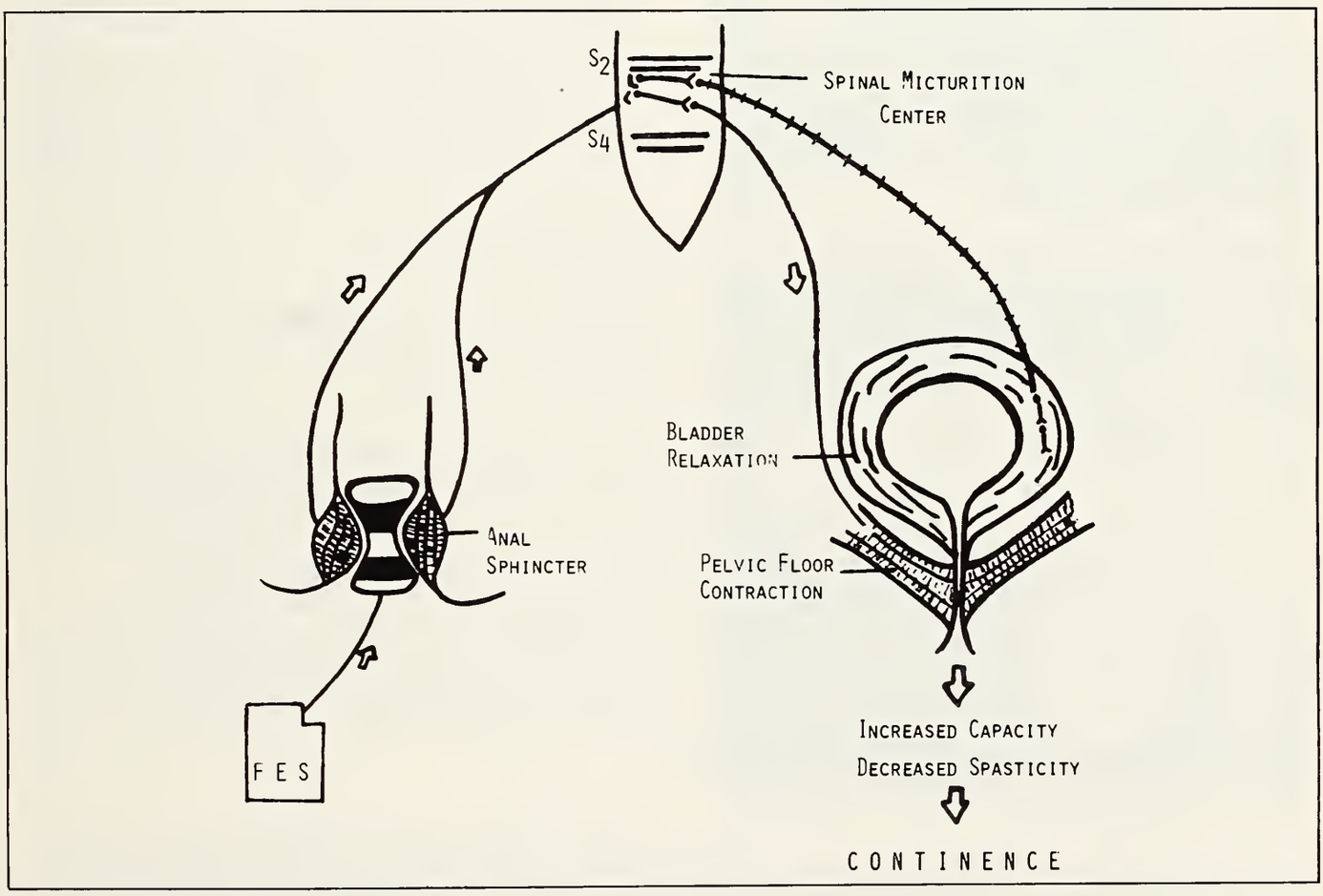


Figure — Functional electrical stimulation (FES) causes reflex contraction of the pelvic floor muscles and reflex inhibition of the bladder.

(Figure). Reflex contraction in all pelvic floor muscles, including the anal sphincter, results from polysynaptic reflex arcs in the micturition center in the S_2 to S_4 spinal cord segments.[18] Total or partial innervation of the pelvic floor muscles, including anal sphincter, must be present for this mechanism to function with FES.[19]

Previous studies have reported on the use of electrical stimulation in the management of incontinence in children. Perineal needles were used in seven out of 41 myelomeningocele children evaluated with a 43 per cent success rate.[1] Implanted electrodes in 15 myelomeningocele children resulted in a 60 per cent success rate.[4] Six children with urethral incompetence had a 83 per cent success rate with implanted electrodes.[10] A 72 per cent success rate was reported in 18 incontinent children with implanted electrodes.[12] In our study, with careful selection of children, a 90 per cent success rate was achieved. However, follow-up showed a 22 per cent relapse rate requiring further treatment of FES.

The careful selection of patients involved cystometry, electromyography of pelvic floor muscles and anal sphincter pressure measurements with and without electrical stimulation to determine if FES will be successful. A rise in anal sphincter pressure with electrical stimulation was found to be a more reliable criteria than a rise in maximum urethral pressure with electrical stimulation.

Acknowledgment

Review and help with manuscript by Dr. G. F. Ayala. Technical assistance by Jean Rice, Robert Kallstrom and Dave Debbins.

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MMA 1978 Annual Meeting, Duluth, Minnesota

The Recognition and Care of the High Risk Pregnant Patient and Neonate

6 credit hours — Friday, May 12, 8:00-11:00 a.m./2:00-5:00 p.m.

Jack L. Strobel, M.D., Course Director

The educational objective of this 6-hour course is to further enlighten those physicians involved with obstetrics and newborn care relative to the management of the high-risk pregnant patient and the distressed neonate. The course will be divided into two parts. The obstetric aspect will include the identification of the truly high-risk patient, the clinical and newer laboratory modalities available for the critical assessment of the pregnancy, and the intrapartum management of the high-risk situation. The neonatal section will outline the care of the asphyxiated neonate, the early recognition of the more subtle problem neonates, and considerations for stabilization of the sick neonate and transport when necessary.

Soft Tissue Injuries and Soft Tissue Disease

3 credit hours — Friday, May 12

A course discussing soft tissue injuries and disease surrounding the bones and joints. Diagnosis and treatment of tendon ruptures, tennis elbow, back injuries and rheumatoid arthritis.

Coordinated Care for Cerebral Palsy

JOHN T. ANDERSON, M.D.*; THOMAS H. COMFORT, M.D.†; PETER J. STRAND, M.D.‡; and ROBERT B. WINTER, M.D.#

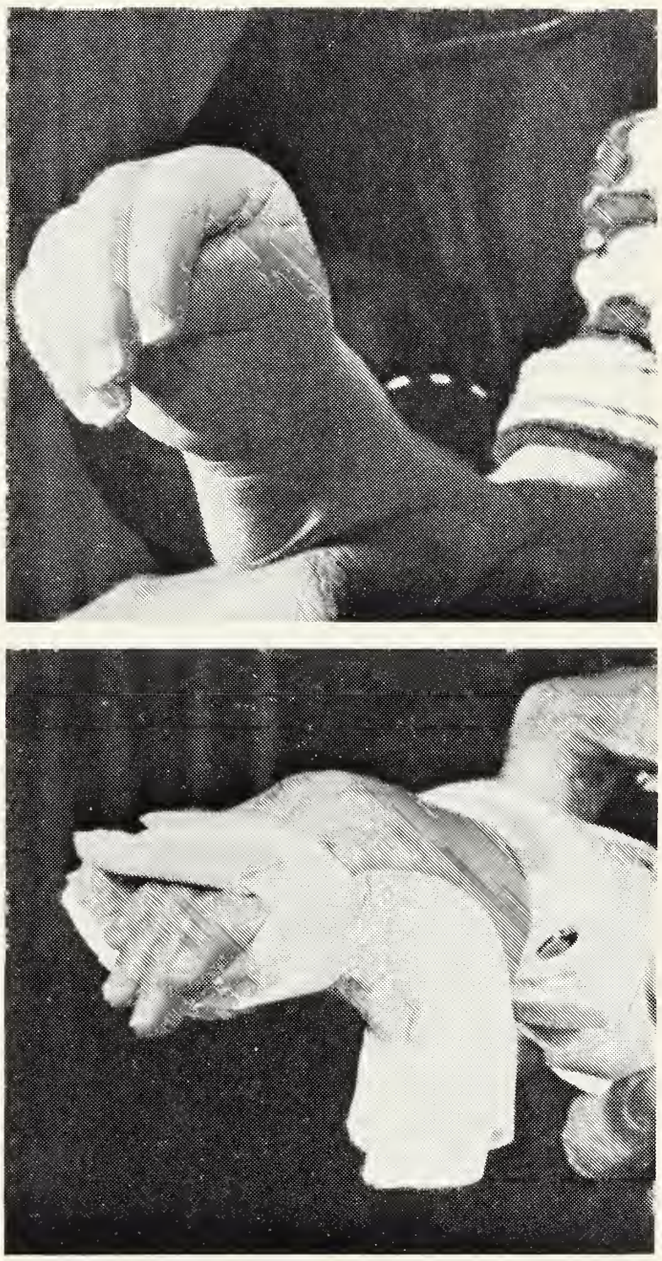
The best way to meet the needs and to obtain the optimum potential of the child afflicted with cerebral palsy is the adaption of a multidisciplinary team approach including the primary care physician as well as those physicians and allied health personnel particularly trained and an expert in the evaluation and treatment of the child with cerebral palsy. An example of this type of program is practiced at Gillette Children's Hospital of St. Paul, Minnesota is presented.

CEREBRAL PALSY, "a disorder to movement and posture due to a defect or lesion of the immature brain"[3] is not a single disease entity or a specific handicap. Rather, it is an administrative term used to categorize a variety of handicapping conditions with certain common characteristics resulting from a fixed, non-progressive lesion of the brain. Cerebral palsy develops early in life; approximately 85% of those afflicted have the condition from birth, and the other 15% from the first few months of life.[9] The primary disorder may include motor control, sensory disturbance, balance, speech control, seizures, mental retardation, hearing or visual impairment. Each case varies in the components and degrees of involvement.

The prevalance of cerebral palsy in this country is seven per 100,000 infants.[21,23,28] On the average, one of the seven dies at a very young age, two are mentally retarded and require custodial care, one is severely disabled but able to exist in the community, two are moderately disabled and responsive to medical treatment, and one is mildly disabled and requires little if any treatment. Overall 40% are severely retarded and uneducable, 40% are below average, and 20% have normal intelligence or above.

Classification and Description

Although several classifications of cerebral palsy have been proposed based on the region affected, the site of pathologic change, and predominant features seen, three major types comprise 90% of all patients seen.



Figures 1A (top) and 1B (bottom) — Typical "thumb-in-palm" posturing of hand in a young cerebral palsy patient. Exercises and bracing at this early age are utilized to prevent deformities and contractures.

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I. The *spastic* type occurring in 65% of cerebral palsy patients is secondary to a lesion in the cerebral cortex which causes loss of control and differentiation of fine voluntary movements with increased muscle tone. This difficulty in achieving fine coordinated muscle action results in asymmetrical use of the extremities. Spastic cerebral palsy is recognized clinically early in infancy by a lack of reciprocal kicking and a tendency for one hand to be fisted in the prone position, particularly in the hemiplegic patient. Later in the first year of life primative postural and righting responses such as the lateral and forward parachute reactions and placing responses in the lower extremities are poorly performed or slower on the affected side. The spastic paralysis has a predilection for specific groups of muscles, with many variations depending on the disease syndrome. In the upper extremity, spasticity is more marked in the flexor groups. The shoulder is typically adducted, flexed, and internally rotated; the elbow is flexed; the wrist and fingers are flexed; and the thumb is adducted into the palm (Figures 1A and 1B). In the lower extremity, the hip is commonly adducted, flexed and internally rotated; the knee is flexed; and the ankle is held in an equinus position. This form is further characterized by positive Babinski reflexes, ankle and patellar clonus, hyperreflexia, exaggerated stretch reflex and a tendency for contractures to develop.

II. The *athetoid* occurs in 20% of cerebral palsy patients. It is secondary to a disturbance in the extrapyramidal system, usually in the basal ganglia. Athetosis is characterized by involuntary writhing or squirming movements that are irregular, coarse, relatively continuous and somewhat rhythmic. They are generally greater distally than proximally in the extremities. The face, neck, and trunk may be involved with facial grimacing. Dystonic movements, ballismus, and tremor are also frequently seen in this type. In contradistinction to spasticity, athetosis is characterized by hypoactivity of reflexes, absence of clonus and Babinski reflex, less tendency toward contractures and difference in muscle tone.

III. The *ataxic* type occurring in 5% of cerebral palsy patients is due to cerebellar dysfunction which causes a loss of muscular coordination in which all kinesthetic sense is impaired. Pure ataxia is rare, and other neurologic abnormalities in the limbs such as increase in muscle tone, hypotonia, athetosis, or tremor are commonly seen. Clinically, ataxia is characterized by loss of posture and balance with the eyes open or closed. With a midline lesion, there is a widebased gait which is quite unsteady. The patient is unable to walk tandem or follow a straight line on the floor. He may sway in *any* direction. In unilateral cerebellar disease, however, there is persistent swaying or deviation toward the affected side. The ataxic patient may improve spontaneously more often than do patients with other types of cerebral palsy.

Cerebral palsy may also be classified by distribution of involvement. *Quadriplegia* means all four extremities are involved and results from a lesion involving the entire motor cortex or connecting tracts. *Hemiplegia* refers to unilateral involvement of two extremities and implies the entire motor area in one hemisphere is affected. *Paraplegia* means both lower extremities are affected and results from a midline lesion to include the leg area of each cortex. *Triplegia* means three extremities are involved and the disorder is localized to the motor area of one entire hemisphere with extension across to include the leg area of the opposite cortex. *Monoplegia* refers to one extremity involvement and represents a relatively localized lesion in the motor cortex of the arm or leg area in the opposite cerebral hemisphere.

Combining terms referring to type and localization of involvement as outlined above will allow one to adequately describe the condition seen.

Etiology

The non-progressive brain disorder found in cerebral palsy develops shortly before, during, or soon after birth. Birth and obstetrical factors account for 60-70% of these patients.[9] Cerebral palsy is three times more frequent in premature infants than in a full term baby. The premature infant is especially susceptible to unavoidable intracranial hemorrhage at birth. In full term babies, difficult labors and traumatic deliveries are the most common cause of cerebral hemorrhage. The clinical result of intracranial hemorrhage is usually spasticity. Excessive sedation, anesthesia, umbilical cord about the neck, difficulty in resuscitation of the infant following delivery, and premature placental separation are common causes of hypoxia or anoxia which usually clinically results in athetosis.

In the past, kernicterus was the cause of cerebral palsy in about 6% of patients. Severe jaundice from Rh and blood incompatibilities such as erythroblastosis fetalis causes kernicterus with athetosis, usually resulting from involvement of the basal ganglia.

Prenatal causes account for approximately 10% of cases. Rubella or other viral diseases during the first trimester of pregnancy are important resulting in congenital deformities of the brain. These are often clinically recognizable as completely symmetrical

disturbances, especially of the ataxic or athetoid type. Asymmetrical involvement is more likely due to intracranial hemorrhage which tends to be irregular.

Early postnatal causes account for 15%. Encephalitis is the most common cause in this group. Seizures in early infancy causing intracranial hemorrhage along with traumatic closed head injuries are other postnatal causes.

Initial Evaluation

Infants may come to the family physician or pediatrician initially for observation because they are considered "at risk" following a difficult delivery or seizures in the neonatal period. They may also appear at a later age because of delay in developmental milestones, particularly delay in walking. Following recognition of cerebral palsy the physician must identify the cause, extent and general classification.

Since the spectrum of clinical problems in cerebral palsy is broad, each patient requires careful evaluation so that treatment appropriate for individual problems may be planned. Although visual disorders are common, they are unfortunately frequently overlooked. Strabismus, disorganized eye movements, and diminished visual acuity must be carefully evaluated. The association between high tone hearing loss and hyperbilirubinemia must be remembered. Because communication disorders are frequent and can be devastating emotionally, speech and language therapy may be the single most rewarding part of the total therapy program. Awareness that children with brain damage have four to five times as much behavior disturbance as ordinary children should lead to counseling to ease the crises that invariably occur in these families.[28] Seizures, the most common of the neurological disorders associated with cerebral palsy, are effectively controlled in the majority of patients. This treatment may eliminate secondary learning impairment.

Early orthopaedic evaluation is imperative for every child with cerebral palsy to prevent severe, incapacitating forms of scoliosis, foot imbalance, hip subluxation and dislocation, and contractures as well as to plan reconstructive surgery. The frequency of such surgical procedures will be markedly reduced when the orthopedic surgeon sees all patients early and participates in or directs the orthopedic aspects of team therapy.

The Team Approach

The Gillette Children's Hospital multidisciplinary team approach to the evaluation of each child's cerebral palsy has proven most effective. This program, designed to care for the many associated conditions discussed above, begins when the family physician or pediatrician contacts the hospital. The balance of the team includes consultants in pediatric neurology, ophthalmology, audiology, dentistry, urology, clinical psychology, social service, speech and language pathology, and physical and occupational therapy. Whether the child's program includes all or only a few of these professionals, a coordinated program of care is outlined to maximize the child's growth and development.

This coordination of total care ensures that the many facets of treatment will be purposeful and consistent with the education, ambulation potential, and various goals for each patient. This program will also specify any need for continued treatment or follow-up at Gillette Children's Hospital as well as to direct what is available and can be done for the child in the family's local community.

Treatment

As each case of cerebral palsy is different, each calls for a distinct treatment program. Major emphasis in all cases is on the day-to-day teaching and stimulation of skills that will assist the child in growth and development.

Flexible for individual patients, each program has certain common ingredients. Speech, vision and hearing are given major emphasis in the early years when they most affect learning. Seizures, when present, are controlled medically. Selected patients may be medically treated for spasticity or hyperactivity.

For musculoskeletal problems, three basic modes of treatment are available: exercises, bracing, and surgery. If exercises and bracing are utilized to the fullest to prevent deformities and contractures, these measures may also preclude the necessity for later surgery. Activities are provided that encourage the child to assume an upright position. Physical and occupational therapy offer combined play and exercise to teach the child how to relax and control his or her muscles. Group activities and competitive games are encouraged for both physical and psychological development.

When fixed deformities occur which require surgery despite early preventive exercises and bracing, the age interval of four to eight years is generally the best time to correct these problems particularly by soft tissue surgery rather than later bony surgery.

Surgery may include tendon lengthening, myotomy,

local neurectomy, tendon transfer, osteotomy, arthrodesis, or combinations of any of the above. Generally, soft tissue procedures are attempted early before fixed bony abnormalities develop. Once bony deformities occur, soft tissue surgery will not suffice and bony surgery is necessary.

The one common problem in spastic cerebral palsy is dislocation of the hip. Before dislocation develops, progressive limitation of abduction and extension of the hip will usually be seen, resulting in an adducted and flexed hip deformity. This is a result of spasticity and contracture of the hip adductors and flexors and combined with relative weakness of the abductors and extensors. When the deformity becomes sufficient to threaten lower limb function and to interfere with perineal care, or to threaten hip subluxation or dislocation, adductor tenotomy with anterior obturator neurectomy and iliopsoas recession followed by adequate postoperative physiotherapy can provide good results.

If however, valgus and anteversion of the femoral neck has developed and these are major factors leading to subluxation or dislocation, soft tissue surgery alone will not be sufficient to control the problem. In this case, correction of muscle imbalance and contracture coupled with varus and derotation osteotomy is necessary to correct the problem and prevent recurrence.

Postoperative care and training must be thorough to maintain the benefits of the surgical procedure. Failure to provide such care has lead to many failures in the past. This has lead to erroneous conclusions about the value of such surgery. Excessive over emphasis on non-operative management is no more appropriate than excessive attention to operative treatment. A proper balance is ideal. Green and McDermott[14], and Banks and Green[2], and others have shown that if adequate postoperative care with a well supervised program of exercise and night supports, the recurrence of deformities can be markedly prevented.

Other Considerations

In addition to the surgical indication limitations for particular type and severity of handicap are the ambulatory potential, motivation, mental capacity and associated cerebral handicaps including the sensory deficit. It is in the spastic type of cerebral palsy that surgery is the most useful. In other forms, soft tissue procedures are seldom indicated; for example, in the athetoid patient. Transferring or lengthening muscles in the athetoid are very difficult to predict as their patterns are continually shifting. Fortunately, in pure athetosis constant spasm of the muscles and myostatic contractures do not usually develop.

Ambulatory potential must be evaluated prior to planning an operative procedure in the lower extremities. Sitting balance is necessary for transferring and standing balance is necessary for ambulation. In general, one does not perform surgery to allow ambulation on a patient who lacks standing balance. In patients who have the potential to ambulate but are severely retarded, the indication becomes less clear but surgery should be performed if it will permit a more self independent state of life.

Summary

The definition, prevalence, general classification, etiology, and general treatment principles of cerebral palsy are discussed. Early recognition and full multidisciplinary evaluation are imperative to establish a coordinated program of care and to maximize the child's growth and development.

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Warning: There have been several reports, published and unpublished, concerning nonspecific small-bowel lesions consisting of stenosis, with or without ulceration, associated with the administration of enteric-coated potassium tablets alone or when they are used with nonenteric-coated thiazides or certain other oral diuretics. These small-bowel lesions have caused obstruction, hemorrhage and perforation. Surgery was frequently required and deaths have occurred. Available information tends to implicate enteric-coated potassium salts, although lesions of this type also occur spontaneously. Therefore, coated potassium-containing formulations should be administered only when indicated and should be discontinued immediately if abdominal pain, distention, nausea, vomiting, or gastrointestinal bleeding occur. Coated potassium tablets should be used only when adequate dietary supplementation is not practical.
Precautions: In response to a rise in the concentration of body potassium, renal excretion of the ion is increased. With normal kidney function, it is difficult, therefore, to produce potassium intoxication by oral administration. However, potassium supplements must be administered with caution, since the amount of the deficiency or daily dosage is not accurately known. Frequent checks of the clinical status of the patient, and periodic ECG and/or serum potassium levels should be made. High serum concentra-

Time is the test of all things



ons of potassium ion may cause death through ardiac depression, arrhythmias or arrest. This rug should be used with caution in the presence cardiac disease.

In hypokalemic states, especially in patients a salt-free diet, hypochloremic alkalosis is a ossibility that may require chloride as well as otassium supplementation. In these circumances, Kaon (potassium gluconate) should be upplemented with chloride. Ammonium chlode is an excellent source of chloride ion (18.7 Eq. per Gram), but it should not be used in atients with hepatic cirrhosis where ammonium alts are contraindicated. Other sources for loride are sodium chloride and Diluted ydrochloric Acid, U.S.P.

It should also be kept in mind that ammonium cle cation exchange resin, sometimes used to eat hyperkalemia, should not be administered to patients with hepatic cirrhosis.

Adverse Reactions: Nausea, vomiting, diarrhea and abdominal discomfort have been reported. The symptoms and signs of potassium intoxication include paresthesias of the extremities, flaccid paralysis, listlessness, mental confusion, weakness and heaviness of the legs, fall in blood pressure, cardiac arrhythmias and heart block. Hyperkalemia may exhibit the following electrocardiographic abnormalities: disappearance of the P wave, widening and slurring of QRS complex, changes of the S-T segment, tall peaked T waves, etc.

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Overdosage: See Kaon Tablets.

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* **Indications:** When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. (See Box Warning.) Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes.

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

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Editorials

Gillette Children's Hospital

GILLETTE CHILDREN'S HOSPITAL dipped in the Fountain of Youth when it moved last spring from its old, rambling home at the edge of St. Paul's Phalen Park. It emerged in a brand new building next to St. Paul-Ramsey Medical Center as fresh as a child,* garbed in contemporary colors and looking thousands of square feet slimmer. On April 23, 1977, — just five days after opening its clear glass doors — Gillette celebrated its 80th birthday.

Many Minnesota physicians remember Gillette Children's Hospital as the first publicly financed hospital in the nation devoted to the care of handicapped children. But since 1973, it has been a public non-profit regional center with its own board of directors appointed by the governor. In its new location at University Avenue and Jackson Street in St. Paul, it remains dedicated to the complete care of handicapped children from all walks of life referred by doctors, parents and members of agencies and systems concerned with good health.

Its medical staff of 75 continues to treat children from birth to 21 and over with musculoskeletal, neurological, urological, growth and other disabling disorders. Working with the medical staff is a highly specialized team of orthotists, prosthetists, speech-language pathologists and audiologists, child development specialists, orthopaedic nurses, and physical, occupational and recreational therapists. Other than for the indigent child, services are financed as they are in other non-profit hospitals across the United States, through patient cost fees and benefactors.

"The difference," says Dr. Robert Winter, Director of Medical Education, "is that the new Gillette facilities are attractively set up for today's needs. The clinic is not more than 30 steps from Xray and only a few more from rehab, the brace shop, or any place the patient must go. Flow and efficiency are very good."

In the new building, Gillette Children's Hospital occupies the entire fourth floor and parts of third and first floors. Facilities are financed through the state legislature and a grant from federal Hill-Burton funds.

There are 14 examining rooms, seven on each side of a large work island equipped with central dictating phones, view boxes, and tall work desks to make record keeping simple as doctors go from one examining room to the next. There is access directly to the fourth level from Gillette's ramp space through the electronic sliding doors and from the elevator lobby entrance. Surgery and the recovery room are on the third floor, and a 50 by 30 foot therapy pool and dressing rooms are on the first.

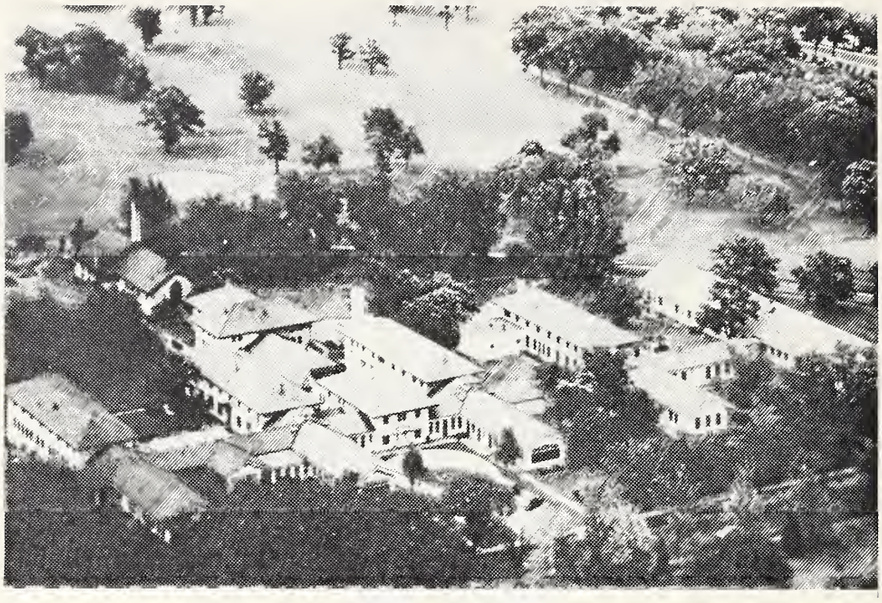
Dr. Wayne Thompson, Gillette Chief-of-Staff, notes that "the central location off the freeway makes Gillette easy to reach from all points in Minnesota and other states. And there is a tremendous advantage here because we are sharing medical staff as well as services with St. Paul-Ramsey."

Through sharing of services, there will be a projected annual savings of $1 million in operational costs for the two hospitals. Shared services include: medical photography, Xray, laboratory, pharmacy, post-operative recovery room, dietary, laundry, plant operations, maintenance, medical and non-medical supplies, and the therapy pool.

Because Gillette is leasing 60 beds from St. Paul-Ramsey rather than building facilities to house beds, there was an additional giant-sized savings of

*See cover photograph.

Cover credit goes to Gordon Dunn, director of medical photography at Gillette, and Ken Jandl, medical photographer.



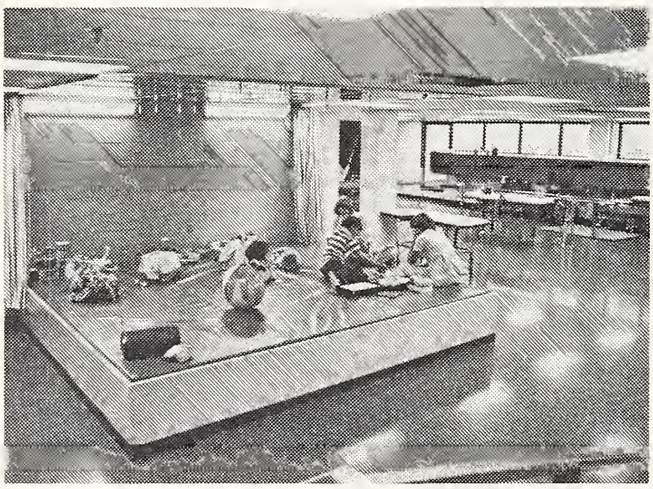
Old Gillette — 1911.



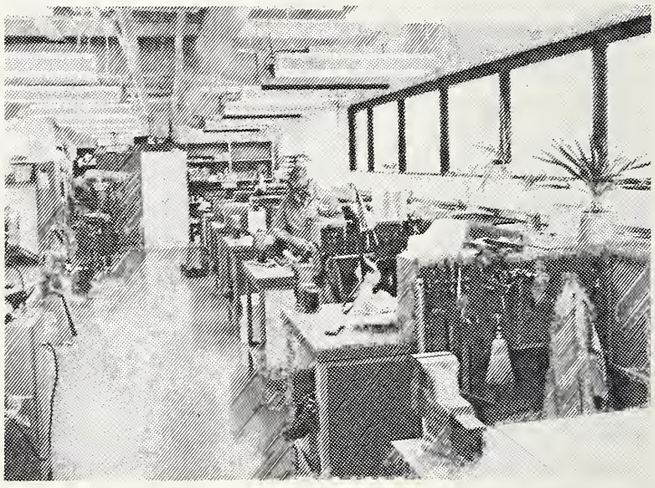
Jean Conklin, administrator from 1949 — mid 1977, and Dr. Robert Winter, medical education director, at the old hospital before the move.



The nursing circles operate efficiently and are decorated in contemporary designs.



Rehabilitation therapists, under a mirrored ceiling, work with a child on the exercise mat. The airy room has plenty of space for the handicapped patient to participate in a variety of therapeutic activities.



In the Orthotics and Prosthetics Laboratory (partial view shown), a variety of orthoses and prostheses are designed and constructed to meet the needs of individual patients.

All photo credits, including cover, go to Gordon Dunn, director of medical photography at Gillette, and Ken Jandl, medical photographer.

$4.5 million in capital expenditure plus annual interest bearing costs of $360,000 to help contain patient costs.

In the two nursing circles that Gillette occupies there are two-and-four-bed rooms which can be easily converted into isolation units if necessary, or can be occupied by girls one time, boys another, depending on admittances. The parents' waiting room, located directly on the circle, keeps them near their children.

Children like to have eye contact with people, and now they can always see the nurses in the central work area. It's reassuring and keeps them from getting lonely and enables the nurses to keep a constant watch on their patients.

The two operating rooms on third floor are designed to accommodate Gillette's orthopaedic needs with special operating tables which can be swung around depending on which side the surgeon is working. Gillette leases St. Paul-Ramsey's recovery room. "This way," notes Dr. Winter, "the expertise of a large medical center's intensive care unit is available immediately if the children need it."

Gillette Children's Hospital is one of the few hospitals in the United States approved to give training in children's orthopaedics; it is affiliated with Mayo Foundation, Veterans' Hospital, and the University of Minnesota, and in addition shares a medical fellow in urology with St. Paul-Ramsey. Seventy per cent of Minnesota's orthopaedic surgeons have received training at Gillette, which also provides in-service training in orthopaedic and pediatric nursing, in physical, occupational and recreational therapy, and in orthotics-prosthetics.

In addition to the teaching areas of clinics, surgery and nursing circles, the medical staff can meet in a 75-chair evaluation theater designed with special features for projection. The board room and comfortable doctor's lounge also have view boxes and screens. Behind new Gillette's decor of Charlie Brown figures and contemporary family room appearance lies the founding tradition that all children are entitled to receive the best care possible in order to live their lives to the maximum potential.

In 1897, Dr. A. J. Gillette, a pioneer in orthopaedic surgery, and Miss Jessie Haskins, a handicapped student at Carleton College, persuaded the Minnesota legislature to appropriate funds for the free care and treatment of handicapped children. In so doing, Minnesota became the first state and Gillette the first publicly financed hospital in the nation to work with crippled children. Minnesota was a model for the country when, in 1935, the Crippled Children's Services Act was passed.

The hospital was initially housed in a ward and then in a separate building on the grounds of City and County Hospital, a predecessor to today's St. Paul-Ramsey Medical Center. The two hospitals were perhaps the earliest in the country to be partners in the shared services concept.

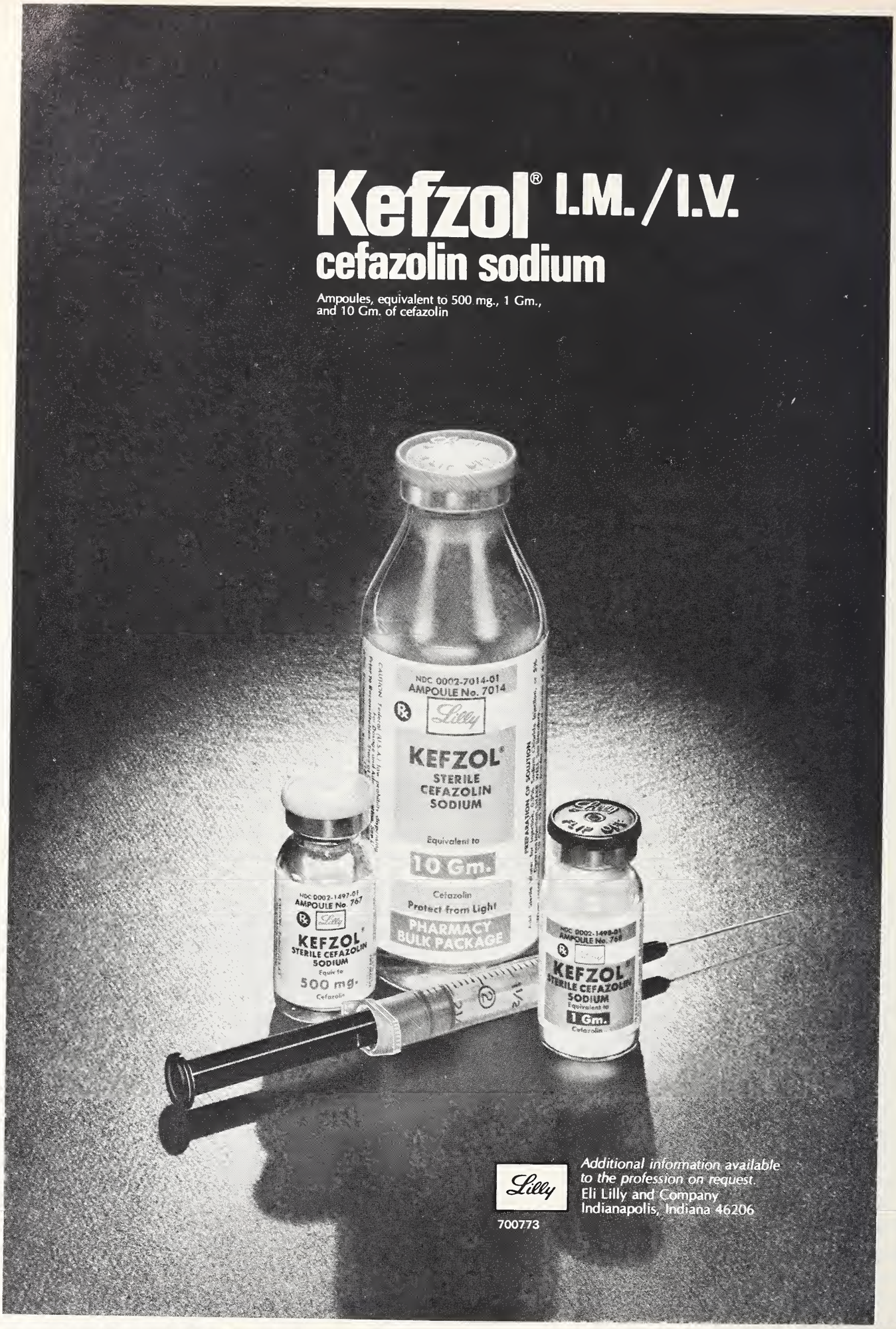
The cost of care was so low that the original appropriation of $5,000 took care of 80 children for two years. At first Gillette Children's Hospital was considered an orphan whose prospects were not very bright, but by 1911 so many children came for its unique care that the hospital moved to a newly built country "fresh-air" hospital on 23 acres at Phalen Park. The land was a gift of the citizens of St. Paul and Minnesota and was designed for convalescent care for children usually one to five years, with polio, tuberculosis, or congenital handicaps. (The average stay today is eight days, with annual outpatient visits of 30,000.)

Through the years, the Minnesota legislature has changed the laws, so that today children with orthopaedic and related disorders all over the world can be treated at Gillette. Minnesotans continue to provide financial assistance to the indigent children of the state not covered by medicaid. Surgical fees collected by doctors are applied to the Medical Education and Research Account (MERA).

Gillette's five Chiefs-of-Staff have been orthopaedic surgeons; each has been associated with the University of Minnesota's Department of Orthopaedic Surgery in teaching or directorship capacity. Dr. Carl Chatterton, partner and successor to Dr. Gillette, was an outstanding orthopaedic teacher and founding member of the Clinical Orthopaedic Society and the Minnesota-Dakota Orthopaedic Society. His successor, Dr. Wallace Cole, took on Chief-of-Staff responsibilities at different hospitals at varying times during his career.

The fourth Chief-of-Staff was Dr. John Moe. While at Gillette, he established the scoliosis clinic (later the Twin Cities Scoliosis Center) which has become internationally renowned. He was a founding father of the Scoliosis Research Society and served as president from 1966-1968. Dr. Thompson, a member of the American Society for Surgery of the Hand, has been Chief-of-Staff since 1973. Dr. Winter, past president of the Scoliosis Research Society, and secretary of the Pediatric Orthopaedic Society, started as Gillette's first Director of Medical Education in 1969.

During the years following World War I, Elizabeth McGregor served as administrator while her sister, Margaret McGregor, supervised the school of nursing.


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When Miss McGregor retired in 1949, Jean Conklin became administrator; under her direction the program continued to grow until it included all of its current departments and moved to its new location.

Today, Joseph Brown is administrator.

The monumental task of moving a hospital which had been in one spot for 66 years was completed last spring in four days, missing only two days of surgery.

The new doors opened April 18, 1977.

*Director of Public Information, Gillette Hospital.

Shirley Staub*
St. Paul, Minnesota

Back Pain in Children

DRS. WINTER and Lipscomb* have given us a fine review of the common etiologies for back pain in the child. The article is beautifully organized and gives a well documented group of symptoms and findings along with recommended methods of evaluation for each of the multiple conditions which can cause back pain in a growing person. This article could very well serve as a reference for clinicians involved in the care of children as well as for residents in both pediatrics and orthopedic surgery.

*See page 141.

Joseph M. Tambornino, M.D.
Minneapolis, Minnesota

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Clyde F. Marquardt

WENDELL R. ANDERSON
MINNESOTA

United States Senate

WASHINGTON, D.C. 20510

January 26, 1978

Dr. Chester Anderson
President
Minnesota State Medical Association
Hector, Minnesota 55342

Dear Dr. Anderson:

I am pleased to report that the member of Mediclinics International Medical Seminars have been invited to attend special seminars in Scandinavia next June. A special invitation has been extended to the doctors of the State of Minnesota and the surrounding upper northwest.

The group will leave on June 17, 1978, and return on July 4, 1978. Seminars will be held at the Medical School at the University of Copenhagen, the University Hospitals, the Huddinge Hospital and the Karolinska Hospital in Stockholm, the Institute of General Medicine, the Institute of Social Medicine and the Institute for Experimental Medical Research at Ulleval Hospital in Oslo as well as the Medical School of the University of Helsinki.

These seminars will give the doctors of Minnesota and the upper northwest an opportunity to study the problems and progress of medicine in the entire Scandinavian area. It is anticipated that many Minnesota doctors will participate.

Doctor Donald R. Lannin, Mediclinics, 832 Central Medical Building, St. Paul, Minnesota 55104 is in charge of making the arrangements.

With warmest regards.

Sincerely,

Wendell R. Anderson
U.S. Senator

WRA:jbr

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Syndactylism

GARY E. WYARD, M.D.;* WAYNE W. THOMPSON, M.D.;† and VINCENT E. EILERS, M.D.†

A long-term follow-up review of twenty-six patients with simple and complex syndactyly of the hands treated at Gillette Hospital between 1950 and 1974. Sixty-six interstices are reviewed to determine: (1) Success of commissure formation, (2) Success of side repairs, (3) Difference between simple versus complex types and (4) Comparison of follow-up results based on age at time of initial repair. A brief discussion of the problem, a historical review on surgical techniques, and a presentation of current surgical techniques at Gillette Hospital are presented.

THIS ARTICLE is based on a long-term follow-up of twenty-six patients treated at Gillette Hospital from 1950 to 1974 with congenital syndactylism. All patients reported on were seen and evaluated at follow-up by at least one of the authors. A review of the literature, a brief historical review of surgical approaches and a detailed report of our results are presented.

Syndactylism can be classified as congenital and acquired. The congenital type is an inheritable or developmental defect characterized by complete or partial webbing of the fingers. This varies in degree from a slight distal extension of normal web to complete fusion extending to the ends of the fingers. It is called complete when it extends to the tips of the digits and incomplete when the fusion is of a lesser degree. When the phalangeal bones are normal, the type is described as simple. When the phalangeal bones are abnormal in size, shape, number and arrangement, the type is described as complex. Frequently, abnormalities of nerves, vessels and tendons are also present.

Syndactylism most often affects the ring and middle fingers or the small and ring fingers and more rarely, the thumb and index finger. In several large series the frequency of involvement was as follows:

	Thumb-Index	Index-Middle
Kettlekamp & Flatt	7%	15%
Nylen	14%	18%
	Middle-Ring	**Ring-Little**
Kettlekamp & Flatt	50%	28%
Nylen	43%	25%

It is the most common hand deformity according to Bunnell, (1956) and Kelikian, (1974). It occurs once in every 1,000 to once in 3,000 live births. Syndactylism may occur as a developmental defect due to arrested fetal development between the sixth and eighth weeks of fetal life or as a dominant inherited deformity. (Kettlekamp and Flatt, 1961) A family history has variably been reported — Emmett, 18%; Kettlekamp, 40%; Davis and German, 18%; Velasco, 15%; and Skoog, 27%. It is more common in males than females. MacCollum reported 66% in males versus 34% in females; Barsky 56% males versus 44% females; Emmett, 73% males versus 27% females; Zachariae, 66% males versus 34% females; Davis and German 68% males versus 32% females; Kite 63% males versus 37% females; Nylen 84% males versus 16% females and Kettlekamp 60% males versus 40% females. Often syndactylism is bilateral and was reported by MacCollum to be bilateral in 48%; Kettlekamp 40%; Bunnell 50%; Skoog 30%; and Barsky 33%. Congenital anomalies other than those of the upper extremity are common in syndactylism.

Historical Review

Many surgical methods have been described for the repair of syndactylism. The goals of surgery are: (1) To provide a commissure between the involved fingers which is supple and wide enough at the proximal aspect to form a wide interstice with good skin cover. (2) To cover the adjacent sides of the involved fingers with skin that is supple and pliable. To accomplish this, two basic plastic surgery principles should be considered: (1) Scars should be placed to prevent cicatricial tightening, impaired function or secondary deformity and (2) Skin loss should be fully replaced. There are over thirty-six surgical procedures described according

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to Kelikian (1974). Excellent historical reviews have been published by Davis and German (1930), Cronin (1956) and Nylen (1957).

As early as 1810, Zeller described a method to create a commissure with the use of a local triangular flap and later Norton (1881) recommended two triangular flaps. Felizet (1892) used two triangular flaps, one from the dorsal and palmer surfaces and both proximally based and sutured side by side across the depth. Other techniques described are: A dorsal based triangular flap (Agnew, 1883); a quadrangular dorsal flap (Diffenbach, 1834; Bidwell, 1913; Villechaise and Jean, 1927; Cogswell and Trusler, 1937; Oldfield, 1948; Bauer, et. al., 1956; Barsky, 1964); two quadrilateral flaps (Didot, 1849); two triangular flaps sutured side by side other than Felizet method (MacCollum, 1940; Cronin, 1956; Boyes, 1964); and full thickness skin grafts (Davis and German, 1930).

Separation of the fingers has gone through similar technical changes. Didot, (1949), used two large quadrilateral flaps, one for each finger, with the incision running longitudinally across the flexion crease. Other methods to improve upon this include: Triangular flaps (Faniel, 1911); Z-plasties (Blackfield and Hause, 1944); curving or zig-zag incisions (Welister, 1943; Pangman, 1955; Cronin, 1956; Bauer, et. al., 1956; Kettlekamp and Flatt, 1961); and small transverse cuts (Nylen, 1957). Zachariae, (1955) reported on a more elaborate type of zig-zag for separating the fingers as did Kite (1958).

Purpose

The multiple different procedures employed for syndactylism in the past suggest that a review of the problem of treatment or evaluating the results of treatment is difficult. The varying complexities of the original condition and its common association with other anomalies of the hand contribute to the difficulties in estimating the influence of the results of the surgical method used as compared to other factors. There is no reliable basis for evaluating statistics on data in the literature. Only Kettlekamp and Flatt (1961) have reported a personal experience of different methods of surgical repair. In a review of the literature, no report on the long-term results of treatment could be documented other than articles by Ebskow and Zachariae (1966) and Flatt (1976).

The purpose of this study was to review the long-term results of syndactylism treated at Gillette Hospital from 1950 to 1974 based on a review of charts, photographs, Xrays and personal examinations. The points evaluated were: (1) The results of formation of the commissure, (2) The results of separation of the sides of the fingers, (3) The effect of degree on results, and (4) The effect of the age at time of operation on results.

Multiple different surgeons performed the operations and many types of separations and commissures were used. This fact, combined with the varying complexity of the original problem, as already mentioned, makes the evaluation of surgical techniques difficult. However, the Hand Service at Gillette Hospital has drawn certain conclusions from observations of all the syndactyly repairs at this hospital and that treatment plan is also presented.

Material and Methods

At Gillette Children's Hospital between 1950 and 1974 seventy patients were treated for syndactylism. Of these patients thirty-five were able to be contacted and twenty-six consented to be examined by the authors. These twenty-six patients are the basis for this study. The minimum follow-up was one year. The maximum follow-up was twenty-two years. The average length of follow-up was fourteen years and the average age at follow-up was sixteen years.

There were twenty-six patients but thirty-nine hands were evaluated since in thirteen patients the syndactyly was bilateral. The total number of operated commissures were sixty-six. The total number of sides evaluated was 132.

Sixty-six initial operations were performed and thirty-five re-operations. If more webs than one per hand were operated on, they were usually done separately but within the same year. Of the patients presented fourteen were males and twelve were females. Seventeen hands were of the complex variety and twenty-two of the simple type. A family history was present in only two cases. (Tables 1, 2, 3 and 4 give the sex, age and length of follow-up for the initial surgeries.)

TABLE 1

Sex	
Males	14
Females	12

TABLE 2

Type	
Simple	22
Complex	17

TABLE 3

Age At Operation (No. Interstices)	
<18 Months	29
>18 Months	37

TABLE 4

Follow-Up Period	(No. of Patients)
1-5 Years	2
6-10 Years	6
11-15 Years	9
16-20 Years	2
>20 Years	7

TABLE 5

Associated Anomalies	No. of Pts.
Syndactyly Feet	8
Cleft Palate	4
Brachydactyly	3
Apert's Syndrome	3
Poland's Syndrome	3
Polysyndactyly	2
Polydactyly Feet	2
Lobster Claw Hand	2
Hypoplasia Upper Extremity	2
Congenital Scoliosis	2
Tight Heel Cord	1
Constricting Band Ankle	1
Clubfoot	1
Dysplasia Long Bone	1
Hypospadius	1

There were many associated anomalies. The most common associated anomalies were syndactyly of the feet in eight patients and cleft palate in four patients. There were three cases of Apert's syndrome and three cases of Poland's syndrome. (Table 5 gives a list of the associated anomalies.)

The sixty-six commissures and 132 sides were all evaluated separately at follow-up. The sides were rated good, satisfactory and poor. To be classified "good" a side needed good skin coverage, no contractures and minimal limitation to full range of motion. A "satisfactory" result was one in which there was moderate limitation of motion but did not impair function. There would be some cicatricial tightening but no contractures. A "poor" result was one which required surgical revision.

The commissures were graded on depth, width, scar formation and range of motion. A "good" commissure had normal depth, good skin cover and no scar contracture. A "satisfactory" one had only a slightly shallow commissure and mild scarring but only minimal decrease range of motion and no limitation of function. A "poor" result required surgical revision. When fingers had additional congenital anomalies such as abnormal bone and joint formation or brachydactylia the results were based on the above criteria and estimated function of those hands without syndactyly. Each was given an initial and final grading. Initial grading was before any revisions and was based on a review of the charts and the need for revision. Final grades were based on a review of the charts, Xrays, photographs and individual interviews. All patients gave a subjective opinion on their hands.

Numerous surgeons and techniques were used to treat the cases presented. An attempt was made to evaluate these different procedures. However, because of the multiple methods used, different surgeons performing the operations over a long period of time and inadequate descriptions in the operative reports, no reliable data could be obtained.

The effect of the age of the patient at the time of operation on the results was compared for those under eighteen months versus those over eighteen months at the time of surgery based on initial grades and the number of re-operations. The grades for the type simple versus complex were also compared.

Another consideration in evaluation was the graft sites utilized in regard to the healing of those sites. The eventual pigmentation and degree of contracture comparing split-thickness skin graft and full-thickness skin graft were also noted.

Results

In the total series the results are shown in Tables 6 and 7. There was a total of sixty-six commissures. The initial results show thirty-three good, twenty-one satisfactory, and thirteen poor. On final exam the results were thirty-nine good, twenty-four satisfactory, and five poor. Of the total 132 sides there were initially twenty-two good, fifty-nine satisfactory, and fifty-four poor results. The final results were twenty-seven good, eighty-one satisfactory, and twenty-four poor. There were thirty-five re-operations performed.

The results for the patients comparing the types (simple versus complex) are shown in Table 8. In the complex group the results after initial operations were thirteen good, fifteen satisfactory, and five poor for the commissures. The sides were graded two good,

TABLE 6

Results

	Commissures	
	Initial	Final
Good	33	38
Satisfactory	21	23
Poor	13	5

TABLE 7

Results

	Sides	
	Initial	Final
Good	22	27
Satisfactory	58	81
Poor	54	24

Table 8
Initial Results Based On Degree

Complex:	Commissures	Sides
Good	13	2
Satisfactory	15	33
Poor	5	31
Simple:		
Good	15	20
Satisfactory	11	25
Poor	8	23

TABLE 9
Initial Results Based on Age

	Commissures	
	<18 months	>18 months
Good	18	14
Satisfactory	7	14
Poor	2	12
	Sides	
	<18 months	>18 months
Good	14	8
Satisfactory	27	33
Poor	13	39

thirty-three satisfactory, and thirty-one poor. In the simple group the commissures were graded fifteen good, eleven satisfactory and eight poor. The sides in this group were graded twenty good, twenty-five satisfactory, and twenty-three poor.

The effect of the age of the patient at operation was compared for those under eighteen months of age versus those over eighteen months of age at the time of initial surgery. The results are presented in Table 9. For the under eighteen months old age group there were eighteen good, seven satisfactory, and two poor for the commissures. The sides in this group were graded fourteen good, twenty-seven satisfactory and thirteen poor. The over eighteen months old age group showed fourteen good, fourteen satisfactory, and twelve poor, for the evaluation of the commissures. The sides were graded eight good, thirty-three satisfactory and thirty-nine poor. The percentage of poor results for the less than eighteen months were 7% for the commissures and 24% for the sides. For the older than eighteen months age group the percent of poor results was 30% and 49% respectively.

Subjectively all but two patients stated they had satisfactory results. Pigmentation was found to be present in the majority of grafts although this was not a particularly uncosmetic factor. There appeared to be no correlation between degree of pigmentation and whether the graft was split or full thickness. Split thickness grafts performed as well as full thickness grafts.

Discussion

The results of this study emphasized the importance of long-term follow-up in evaluating the results of the surgical treatment of syndactyly. A high percentage of the patients reviewed had initial poor results: 20% of the commissures and 40% of the sides. However, with diligent follow-up and repeated surgical revisions, a better over all objective and subjective grading was eventually possible — 7% poor results for the commissures and 18% poor results for the sides.

The significance of age and operation in this study agrees in part with other authors. Ebskov and Zachariae (1966) found a higher percentage of necessary re-operations in the younger age groups for both the sides and commissures. Kettlekamp, and Flatt (1961) agreed with their data. Skoog, Oldfield, MacCollum, Kite, Barsky, Bunnell and Velasco also advocated waiting until at least two years of age for most cases of syndactyly, although presented no substantial data. Cronin and Bauer, and Tondra and Trusler advocated early intervention. We concluded that early surgery gave better commissure and side results. When poor results are present in the younger group it is most likely because of the tendency for contracture of the skin grafts in this young growing group of fingers.

The results of complex type versus simple type in this study agree with all other articles reviewed. As expected, the more severe the initial problem, the more likely a poor result. This was more apparent for the sides than commissures however.

Our opinion on skin pigmentation agrees with Skoog (1966) and Kettlekamp and Flatt (1966) but is not in accordance with Ebskov and Zachariae (1961). Generally, donor sites from split thickness grafts were more pleasing than full thickness donor sites. However, full thickness grafts are now taken from the groin and this is not a problem.

It is important to analyze the poor results. A high percent of patients had re-operations for flexion contractures on the volar side from scar tightening and scars in the clefts that necessitated deepening operations. In almost all cases this can be related to poor technique such as a loose dressing. No correlation could be drawn between the type of flap nor the type of splitting incisions (zig-zag or curve). No straight incisions were used. Neither did it matter whether full thickness or split thickness skin grafts were used. However, as mentioned, there was a higher percentage of good to poor results in the simple versus complex types.

There were few operative complications. One finger needed to be amputated. This was a left fifth finger in a dominant right-handed person who had simple syndactyly. After initial release, the patient developed a necrosis and skin contracture that necessitated amputation. There was one infection which was given a poor result initially. Subsequently this patient had a contracture revision and then at ten years was graded as a satisfactory.

Technique at Gillette Hospital

Currently at Gillette Hospital with the institution of a special Hand Service, we have established a definite protocol for the surgical treatment of syndactyly. The operation is performed under tourniquet control, after markings are made on the skin.

We use two flaps to create the commissure. Both are proximally based: one on the volar side and one on the dorsal side. They are sutured side by side across the depth of the cleft. In creating a commissure the length of the dorsal aspect is estimated to reach no further than the planned palmer web. The base is over the metacarpal heads. The volar based flap is raised more distally, its base being on the normal palmer web line and no wider than the desired interdigital fold. (The natural slope of the commissure is thus obtained.) For release of the fingers a zig-zag incision is used. Once the release is accomplished the tourniquet is deflated and hemostatis is obtained. A full thickness skin graft is then taken from the groin in an elliptical fashion. This is then separated crosswise and the graft laid on to the sides and fashioned to fit the zig-zag incision after the tourniquet is reinflated. These are then sutured with 5-0 Vicryl suture as are the commissure V-flaps.

The postoperative dressing consists of Adaptic over the incisional areas with soaked cotton balls placed in the web spaces and between the fingers. Fingers are then held in abduction and extension with soft dressings. The dressing is completed with cast padding and dorsal and volar plaster splints covered with coban. This remains for approximately ten to fourteen days at which time it is routinely removed in the Outpatient Department. Further dressings and splints are used as needed but generally are not required.

Summary

This study stresses the importance of a long term follow-up studying the results of surgery in the care of syndactyly. Often one surgery on a commissure fails after a period of time. With diligent follow-up of patients and repeated revisions when necessary statistically improved results can be obtained.

Children under eighteen months of age when they were first operated had better overall results for both commissures and sides.

Simple types got better results than complex types.

Pigmentation, donor scarring and graft breakdown have not been a problem. Complications have been few. Most patients state they have satisfactory results.

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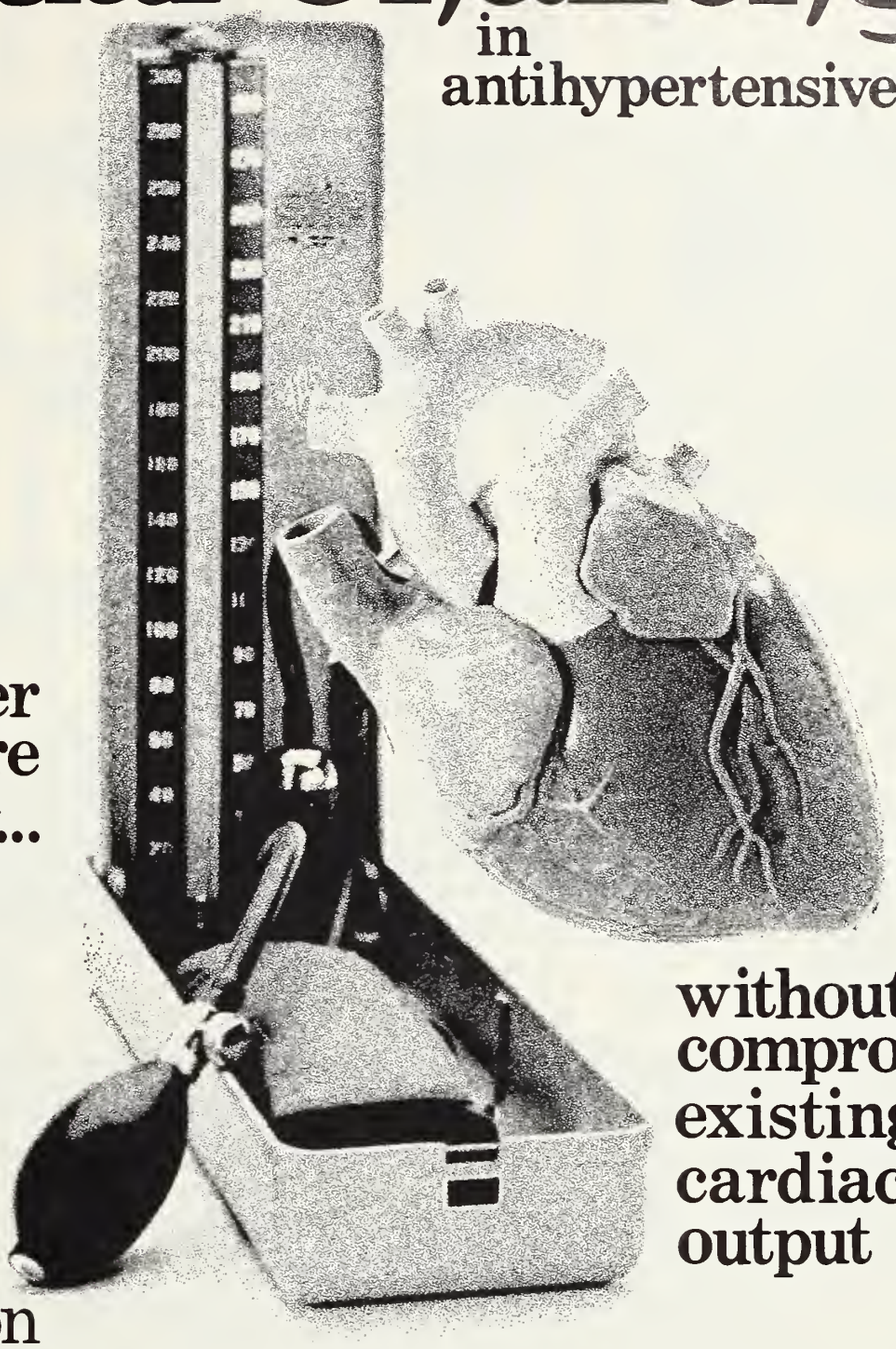
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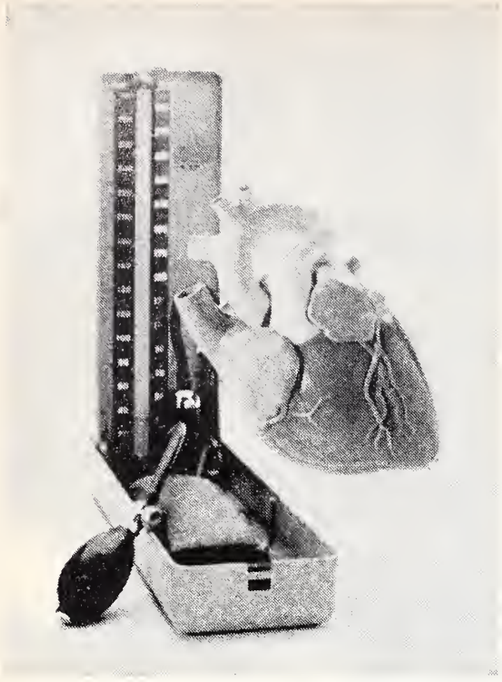
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Pregnancy and Nursing: Use of any drug in women who are or may become pregnant or intend to nurse requires that anticipated benefits be weighed against possible risks; possibility of fetal injury or injury to a nursing infant cannot be excluded. Methyldopa crosses the placental barrier, appears in cord blood, and appears in breast milk.

Precautions: Should be used with caution in patients with history of previous liver disease or dysfunction (see Warnings). May interfere with measurement of: urinary uric acid by the phosphotungstate method, serum creatinine by the alkaline picrate method, and SGOT by colorimetric methods. Since methyldopa causes fluorescence in urine samples at the same wavelengths as catecholamines, falsely high levels of urinary catecholamines may be reported. This will interfere with the diagnosis of pheochromocytoma. It is important to recognize this phenomenon before a patient with a possible pheochromocytoma is subjected to surgery. Methyldopa is not recommended for patients with pheochromocytoma. Urine exposed to air after voiding may darken because of breakdown of methyldopa or its metabolites.

Stop drug if involuntary choreoathetotic movements occur in patients with severe bilateral cerebrovascular disease. Patients may require reduced doses o anesthetics; hypotension occurring during anesthesi usually can be controlled with vasopressors. Hyper tension has recurred after dialysis in patients o methyldopa because the drug is removed by thi procedure.

Adverse Reactions: *Central nervous system:* Seda tion, headache, asthenia or weakness, usually earl and transient; dizziness, lightheadedness, symptom of cerebrovascular insufficiency, paresthesias, parkin sonism, Bell's palsy, decreased mental acuity, involun tary choreoathetotic movements; psychic distur bances, including nightmares and reversible mil psychoses or depression.

Cardiovascular: Bradycardia, aggravation of angina pectoris. Orthostatic hypotension (decrease daily dosage). Edema (and weight gain) usually relieved by use of a diuretic. (Discontinue methyldopa if edema progresses or signs of heart failure appear.)

Gastrointestinal: Nausea, vomiting, distention, constipation, flatus, diarrhea, mild dryness of mouth, sore or "black" tongue, pancreatitis, sialadenitis.

Hepatic: Abnormal liver function tests, jaundice, liver disorders.

Hematologic: Positive Coombs test, hemolytic anemia Leukopenia, granulocytopenia, thrombocytopenia Positive tests for antinuclear antibody, LE cells, and rheumatoid factor.

Allergic: Drug-related fever, lupus-like syndrome myocarditis.

Other: Nasal stuffiness, rise in BUN, breast enlargement, gynecomastia, lactation, impotence, decreased libido, dermatologic reactions including eczema and lichenoid eruptions, mild arthralgia, myalgia.

Note: Initial adult dosage should be limited to 500 mg daily when given with antihypertensives other than thiazides. Tolerance may occur, usually between second and third months of therapy; increased dosage or adding a diuretic frequently restores effective control. Patients with impaired renal function may respond to smaller doses. Syncope in older patients may be related to increased sensitivity and advanced arteriosclerotic vascular disease; this may be avoided by lower doses.

How Supplied: Tablets, containing 125 mg methyldopa each, in bottles of 100; Tablets, containing 250 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 1000; Tablets, containing 500 mg methyldopa each, in single-unit packages of 100 and bottles of 100 and 500.

For more detailed information, consult your MSD representative or see full prescribing information.

Merck Sharp & Dohme, Division of Merck & Co., Inc., West Point, Pa. 19486 J6AMO7R1(709)

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QUANTITY	BRAND NAME®	PRICE	PUREPAC GENERIC	PRICE	SAVINGS
30	Polycillin (250 mg.)	$8.70	Ampicillin (250 mg.)	**$2.40**	**$6.30**
100	Equanil (400 mg.) Ⓒ Ⓥ	8.09	Meprobamate (100 mg.) Ⓒ Ⓥ	**1.83**	**6.26**
100	Darvon Comp. 65 Ⓒ Ⓥ	7.83	Propoxyphene HCl Comp. 65 Ⓒ Ⓥ	**4.63**	**3.20**
100	Pavabid (150 mg.)	11.73	Papaverine HCl T.R. (100 mg.)	**4.33**	**7.40**
100	Thorazine (50 mg.)	6.03	Chlorpromazine HCl (50 mg.)	**3.23**	**2.80**
100	Librium (10 mg.) Ⓒ Ⓥ	7.11	Chlordiazepoxide HCl (10 mg.) Ⓒ Ⓥ	**4.89**	**2.22**

The savings add up! So, when you prescribe generics, specify Purepac, the largest generic manufacturer in America.

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an accredited continuing medical education offering with sessions on

- —Evaluating Thyroid Function
- —Hashimoto's Thyroiditis
- —Management of Thyroid Nodules
- —Clinical Importance of Thyroid Hormone Receptors
- —Diagnosis & Surgical Treatment of Hyperparathyroidism
- —Management of Hyperthyroidism During Pregnancy
- —Endocrine Tumors of the Pancreas
- —Perils of the Pill
- —Postmenopausal Use & Abuse of Estrogen
- —Management of Diabetes During Pregnancy
- —Transplantation of Islet Cells in Management of Diabetes Mellitus

The registration fee is $75, which includes coffee breaks, materials, and lunch and a social hour on Friday.

For further information or to register, write: ENDOCRINOLOGY SYMPOSIUM, MMC, 900 S. 8th St., Minneapolis, Minnesota 55404, or call (612) 347-4412 or 339-7693.

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Minnesota Medical Association

Annual Meeting
May 10-12, 1978

ADVANCE REGISTRATION

Without it, you'll probably stand in line.

Early in March Minnesota Medical Association members will receive a very important piece of mail: registration forms for CME '78. Here is a preview of "Clinical Medicine Explored."

COURSES

3 credit hours:

Recent Advances in Respiratory Disease
Evaluation and Management of the Hypertensive Patient
Evaluation and Treatment of Neurological Problems
Psychotropic Drugs
Soft Tissue Injuries and Soft Tissue Disease
Dizziness — A Panel Discussion
Diagnosis and Therapy of Common Skin Conditions

6 credit hours:

Recent Advances in Clinical Medicine; A Practical Update for ALL Physicians
Electrocardiography
Surgical Management of the Hemorrhaging Patient
Interpretation of Laboratory Data
The Recognition and Care of the High Risk Pregnant Patient and Neonate
Basic Cardiac Life Support Certification

ACCREDITATION

This program will provide an opportunity for 12 hours of credit in Category I of the AMA Physician's Recognition Award, and Prescribed credit for the AAFP. Certificates of attendance will be given. Each registrant will be responsible for keeping his/her own individual CME records for reporting purposes. Credit will be granted on a clock-hour basis for course attendance.

FORMAT

Each course will be either three or six hours long and in session from 8-11 am and 2-5 pm. All will be located in the Arena-Auditorium complex near the exhibits and a skywalk away from the Normandy Duluth, the headquarters hotel. A three-hour break between morning and afternoon sessions means you will have time this year to visit the exhibits AND enjoy your lunch.

REGISTRATION

Advance registration by mail will begin in March and continue through April 28. Indepth courses planned around carefully selected topics demand that you study the course descriptions and make your choices early. Scientific sessions will begin earlier this year, so advance registration will be a greater advantage than ever. It will save you the wait of standing in line, and allow you to enter the sessions on time. SCIENTIFIC PROGRAM REGISTRATION WILL BE OPEN ON WEDNESDAY MAY 10.

OTHER MEETING EVENTS

Golf and tennis tournaments will open the meeting on Wednesday May 10, followed by the opening session of the House of Delegates, reference committees, and committee meetings.

The Annual Meeting Reception, a new activity at this year's meeting, will provide cocktails and complimentary hors d'oeuvres from 7-9 pm in the exhibit area. Exhibits will be open early this year to accommodate the reception. Arrive on Wednesday, register early and attend the Annual Meeting Reception.

Thursday morning the scientific program will begin, and at noon a special luncheon will feature our guest, Dr. Lynn Rogers, an entertaining expert on the black bear. Ask anyone who's heard him speak — you won't want to miss this.

Thursday evening the President's Reception and Annual Banquet will honor outgoing President Chester A. Anderson and other distinguished members of the Minnesota Medical Association who will receive awards for their dedication and service to MMA and the medical profession. Many members of the 1978 Fifty Club will be recognized for their many years of medical practice in Minnesota.

Friday will bring another full day of scientific program and the final session of the House of Delegates, where new officers will be elected. Specialty societies will meet, and selected topics will be offered for round table luncheon discussions.

Throughout the meeting there will be activities scheduled by the MMA Auxiliary for all interested spouses.

Saturday might find many continuing north or west to open summer cottages. Minnesota's 1978 fishing season opens on Saturday May 13.

Watch your mail for information in March. A form for scientific program registration and hotel reservations will arrive first, followed by a registration packet for other activities.

REGISTER IN ADVANCE for this excellent scientific program, and make early reservations for all social events. Plan your arrival in Duluth for Wednesday May 10 and join us at the Annual Meeting Reception.

S. V. Thorson, M.D.
Chairman
MMA Subcommittee on
Scientific Assembly

Continuing Medical Education

Abbott-Northwestern Hospital

Seminar in Cardiology, all day Friday and Saturday morning, May 19-20, at Northwestern Hospital. New hours 6 M &

Contact: Dr. Robert D. Blomberg, Northwestern Hospital, Chicago Avenue at 27th St., Minneapolis (612-874-4000)

University of Minnesota

Allergy and Clinical Immunology — March 16-18, 1978.

Mayo Memorial Auditorium, University of Minnesota, Minneapolis Campus

FEE: To be determined

Sponsored by the Department of Medicine, this annual review provides a variety of educational approaches to assist office-based physicians in applying the most current concepts in the management of allergic and immunologic problems.

Psychiatry for Practicing Physicians — March 16-17, 1978

Nolte Center for Continuing Education, 315 Pillsbury Drive, University of Minnesota, Minneapolis Campus. FEE: To be determined

Co-sponsored by the Departments of Psychiatry and Family Practice and Community Health, this course helps physicians update their skills and procedures in the office management of patients with functional disorders.

This asthmatic isn't worried about his next breath...



he's active
he's effectively maintained on

QUIBRON®

Each capsule or tablespoon (15 ml) elixir contains theophylline (anhydrous) 150 mg and glyceryl guaiacalate (guaifenesin) 90 mg. Elixir: alcohol 15%

- high theophylline for effective around-the-clock therapy
- 100% free theophylline
- individualized theophylline dosage schedule

Indications: For the symptomatic treatment of bronchospastic conditions such as bronchial asthma, asthmatic bronchitis, chronic bronchitis, and pulmonary emphysema.
Dosage: Initial: Adults: 1-2 capsules or 1-2 tablespoonfuls elixir every 6-8 hours, children 8-12: 1 tablespoonful or one capsule every 6-8 hours and children under 8: 3 to 5 mg theophylline/kg body weight every 6-8 hours. Theophylline dosage may be cautiously increased to 2000 mg/24 hr in adults or 7 mg/kg in children; monitoring of serum theophylline levels at higher dosages is recommended.
Precautions: Do not administer more frequently than every 6 hours, or within 12 hours after rectal dose of any preparation containing theophylline or aminophylline. Do not give other xanthine derivatives concurrently. Use in case of pregnancy only when clearly needed.
Adverse Reactions: Theophylline may exert some stimulating effect on the central nervous system. Its administration may cause local irritation of the gastric mucosa, with possible gastric discomfort, nausea and vomiting. The frequency of adverse reactions is related to the serum theophylline level and are not usually a problem at serum theophylline levels below 20μg/ml.
How Supplied: Capsules in bottles of 100 and 1000 and unit-dose packs of 100; Elixir in bottles of 1 pint and 1 gallon.

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Does it influence your choice of a peripheral/cerebral vasodilator*?

- Vasodilan—compatible with coexisting diseases
- Vasodilan—compatible with concomitant therapy
- Vasodilan—compatible with your total regimen for vascular insufficiency

*__Indications:__ Based on a review of this drug by the National Academy of Sciences-National Research Council and/or other information, the FDA has classified the indications as follows:

Possibly Effective:

1. For the relief of symptoms associated with cerebral vascular insufficiency.
2. In peripheral vascular disease of arteriosclerosis obliterans, thromboangiitis obliterans (Buerger's Disease) and Raynaud's disease.

Final classification of the less-than-effective indications requires further investigation.

Composition: Vasodilan tablets, isoxsuprine HCl, 10 mg. and 20 mg.

Vasodilan injection, isoxsuprine HCl, 5 mg., per ml.

Dosage and Administration: Oral: 10 to 20 mg., three or four times daily.

Intramuscular: 5 to 10 mg. (1 or 2 ml.) two or three times daily. Intramuscular administration may be used initially in severe or acute conditions.

Contraindications and Cautions: There are no known contraindications to ora use when administered in recommended doses. Should not be given immediatel postpartum or in the presence of arterial bleeding.

Parenteral administration is not recommended in the presence of hypotension o tachycardia.

Intravenous administration should not be given because of increased likelihood of side effects.

Adverse Reactions: On rare occasions oral administration of the drug has been associated in time with the occurrence of hypotension, tachycardia, nausea, vomiting, dizziness, abdominal distress, and severe rash. If rash appears the drug should be discontinued.

Although available evidence suggests a temporal association of these reactions with isoxsuprine, a causal relationship can be neither confirmed nor refuted.

Administration of single dose of 10 mg. intramuscularly may result in hypotension and tachycardia. These symptoms are more pronounced in higher doses. For these reasons single intramuscular doses exceeding 10 mg. are not recommended. Repeated administration of 5 to 10 mg. intramuscularly at suitable intervals may be employed.

Supplied: Tablets, 10 mg., bottles of 100, 1000, 5000 and Unit Dose; Tablets, 20 mg., bottles of 100, 500, 1000, 5000 and Unit Dose; Injection, 10 mg. per 2 ml. ampul, box of six 2 ml. ampuls.

U.S. Pat. No. 3,056,836

VASODILAN®
(ISOXSUPRINE HCl)
20-mg tablets

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Continuing Medical Education

Q and A — CME

Questions from Minnesota Physicians Concerning Continuing Medical Education may be Addressed to:

MMA Committee on Medical Education
Suite 900
101 East 5th Street
St. Paul, MN 55101

Those answered in MINNESOTA MEDICINE are the most common or the most appropriate to a specific time. Queries from individuals will be answered as rapidly as possible only if a self-addressed stamped envelope is enclosed.

Q. Does the May Scientific Assembly of the Minnesota Medical Association meet the criteria for Category I credit for the AMA-Physician's Recognition Award?

A. The MMA is an LCCME accredited organization. Its planned programs will meet the criteria for Category I. The Scientific Assembly also has always been approved by the Academy of Family Physicians.

Q. My state specialty society has an excellent meeting twice a year with a strong scientific program. How can it qualify for Category I credit?

A. By several possible procedures. The organization may itself seek accredited status via the LCCME. Easier and quicker, is to seek co-sponsorship for each program from an LCCME accredited organization such as one of the medical school departments of CME or one of Minnesota's LCCME accredited hospitals. During 1978, Minnesota Medical Association will be prepared to co-sponsor a limited number of programs of this type. For more information concerning new rules of co-sponsorship, write:

Department of CME & Program Services
Minnesota Medical Association
101 East 5th Street
St. Paul, Mn 55101

Q. I understand that re-registration of my license to practice medicine will require my satisfactory reporting of CME. I've always wanted to stay up to date in my reading, but this demand to report bogey points of various types is too much. I'm not going to do it!

A. The rules being promulgated by the Minnesota State Board of Medical Examiners appear to contain reasonable and attainable CME reporting requirements. They reflect implementation of a Minnesota Statute. If Minnesota physicians believe the law is not reasonable, they should direct their efforts for repeal to those who create the law – their elected public representatives.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

1978's Largest Gathering of Minnesota Physicians Happens in Duluth May 10-12

Shouldn't you be there?

consider this:

What concerns you?

- government regulations
- insurance
- allied health professions
- HSAs, PSROs, HEW, FDA, etc., etc.
- legislation
- public demands
- practice methods
- medical discipline

Speak out through your association — any member can speak at the reference committees

Exchange your good ideas with your peers

Take advantage of

- CME programs
- exhibits of latest products, techniques
- specialty society meetings
- leadership elections
- recognition and awards events
- special entertainment
- tennis/golf tournaments
- brand new hotel
- scenic northern vacation
- opening of fishing season
- MORE . . . MORE . . . MORE



WATCH YOUR MAIL FOR REGISTRATION INFORMATION Or, call:

Dept. of CME and Program Services
MINNESOTA MEDICAL ASSOCIATION
(612) 222-6366

Book Reviews

IS IT WELL WITH THE CHILD—A Parent's Guide To Raising Mentally Handicapped Children.—By Susan Strauss. Pp 152. Price $7.95. Doubleday and Company, Inc., Garden City, New York, 1975.

The author is a mother of three sons—one of whom, Michael is mentally handicapped. In the book, she aptly describes the fears and anxiety likely to be felt by any parent at the birth of a child by relating her own personal experience. In Michael's case, he appeared normal at birth but when he did not gain weight and was restless in sleep, concern developed. Initial medical examinations were unrevealing, but after considerable time and several opinions, he was found to be autistic. (The Greek word "autistic" describes a handicapped child as being aloof, withdrawn from others, and approving sameness.) A special "Home Care" program was set up for Michael by the public school. When Michael's progress began regressing, more drastic action was recommended. Consultations with neurologists, psychologists, and psychiatrists finally convinced the parents that Michael required care away from home. Fortunately, a social worker with knowledge of "residential care" centers was consulted and he recommended a school for exceptional children. At the age of seven, Michael entered this school and he gradually showed improvement. The family's anxiety also was decreased somewhat in the belief that they had done the best thing for Michael.

Many families who have to face the problem posed by a mentally disturbed child do not have the experience or guidance to cope with such a situation. Many specialists are often hesitant to recommend more severe programs for such children because of parental emotions, and often reprisals. Fortunately, parent associations now are being formed in many areas to give aid through the exchange of ideas to distressed parents. Recent surveys show that nearly 15% of the children born today possess some degree of retardation. Some state and local boards of education have taken action by screening children early, and if care is needed special teachers and programs are provided. Private instruction or day school can be provided if the school does not have a program. Any parental expense for "special education" is considered "medical aid" and as such is tax deductible. Ms. Strauss has researched extensively, and has visited schools in both Europe and America. Thus, she is able to suggest and recommend much helpful information in dealing with mentally handicapped children.

The book lists supplemental reading sources on this subject and further notes, names, and addresses of State and Federal Associations for the mentally retarded.

Robert W. Soll, M.D.
Waterloo, Iowa

CURRENT SURGICAL DIAGNOSIS AND TREATMENT, 2nd Ed., J. E. Dunphy and L. W. Way: Lange Medical Publications, Los Altos, Calif., 1975. Price: $15.00.

This is a well written Textbook of Surgery in soft cover. Numerous authors cover the entire field of basic surgical principles and of clinical surgery in 52 chapters. It is surprising how clearly some of the more controversial subjects like breast surgery can be presented. Concise statements are found throughout the book, like "The safest course is to biopsy all suspicious masses found on physical examination and, in the absence of a mass, all suspicious lesions demonstrated by mammography."

The chapters on basic sciences of surgery are strong and most of the clinical fields are also well presented. Recent techniques and innovations are discussed in sufficient depth, as hyperalimentation, Xero-mammography, volume respirators and nuclear medicine. Even a timely chapter on "the Anatomy of Malpractice" has been added.

One might quibble with a few deficiencies like the statement that bilateral simultaneous hernia repair is ill advised because the recurrence rate and morbidity is higher than with one sided repair, with the misspelling of proprietary names of suture material, failure to list intravenous pyelography for the preoperative workup of abdominal aortic aneurysm, or the mislabeling of a figure on page 707.

On the whole, though, this book is very well written, well printed and nicely illustrated. The literature references are current and to the point. Medical students, residents preparing for their boards and practicing surgeons alike will find it well worth its price.

H. W. Heupel, M.D.
Minneapolis, Minn.

HANDBOOK OF HEMOPHILIA. Parts I & II. Edited by K. M. Brinkhous and H. C. Hemker, Elsevier/Excerpta Medica. New York 927 pages, 1975. $135.50.

The eminently qualified editors of these volumes have compiled a prodigious text. The multiauthored tome, from around the world, was over four years in the making, and is the first such hemophilia book published. Due to the inclusion of 90 various writing styles the chapters are inevitably somewhat inconsistent and in a few instances repetitive.

The advances in hemophilia have come rapidly since the advent of modern management in the mid 1960's with Judy Pooles discovery of cryoprecipitate. The text attempts to compile modern attitudes toward biochemistry, pathophysiology, genetics, and treatment. The initial two chapters are well related excursions through the history of this disease. Chapters on research aspects, biochemical facets, clinical areas, psychosocial problems, and future plans are well done with adequate bibliography. A major flaw in the text is a chapter on dosage calculation and administration. The chapter, in the book, is based on calculus and is frightening to the physician looking for an easy explanation—such should have been a part of any explanatory attempt.

The book is obviously one not likely to find its way into a practitioner's library unless a particular interest exists. It is a text well qualified for the library and reference usage of the physician seeking information.

Lawrence J. Singher, M.D.
Minn. Hemophilia Foundation and Clinic
Minneapolis, Minnesota

(Continued from page 182.)

GROUP HEALTH PLAN of Minnesota opening new center in attractive mid-sized community (one hour NW of Twin Cities). Seeking Family Practitioners; must be board certified or board eligible. Excellent salary and fringe benefits. Send CV to Box 80100, St. Paul, MN 55108.

INTERNIST-GENERAL surgeon needed by well-established ten-man family practice clinic located in Minnesota's lake area, serving an area of fifteen thousand people. New hospital, good benefits. Don Erickson, MD, Alexandria 56308. PH. 612-763-5123.

HEAD, DEPARTMENT OF CLINICAL SCIENCES — UNIVERSITY OF MINNESOTA-DULUTH.

TWO-YEAR PROGRAM AT DULUTH was initiated in 1972 with emphasis on family medicine; current enrollment is 48 first-year students, 36 second-year. Department head will be responsible for coordination of all clinical instruction; section heads in various other clinical disciplines chosen from community. Preference will be given to Board certified Family Physicians and other primary care specialists with some practice experience. Academic background should demonstrate strong skills in teaching at both undergraduate and graduate levels. Salary and rank negotiable, commensurate with experience. Interested applicants should forward curriculum vitae and supporting information by 3/15/78 to James G. Boulger, Ph.D., Clinical Sciences Search Committee, UMD School of Medicine, 2205 E. 5th St., Duluth, MN 55812. The University of Minnesota is an equal opportunity employer.

FAMILY PRACTICE group in south metro suburban area wishes to expand to four family physicians. Interested physicians must be board certified or board eligible in family practice. Send inquiries or call Drs. Murray Hunter or Joseph Emond, River's Edge Medical Clinic, 310 Division Street, Farmington, Minnesota, 55024. 612-463-7181, Descriptive brochure available upon request.

PHYSICIANS AVAILABLE — Pediatrics (Minn.), Cardiology (T/C or Minn.), General Surgery (Minn.), Ophthalmology (Minn.), OB-Gyn (T/C), Pathology (Minn.), Family Practice (T/C), Urology (Minn.) Family Practice (Minn.-Wisc.). This is a sampling of physicians seeking opportunities through the services of Metropolitan Medical Placement. If you are interested in adding an additional staff member, please contact Mr. Hultstrand or Mr. Holmes at (612) 831-5232.

400 ACRES OF MATURE FOREST nestled into the St. Croix WILD RIVER COUNTRY. A recreational wonderland. Spring fed lake. Cabin. ¼ mile to all weather road. Adjacent to the St. Croix Forest. Will divide. For information, call 612-861-4591 or write E. E. DeJarlais, c/o The Spring Company, 404 W. 65th St., Mpls., Minn. 55423.

DIRECTOR OF MEDICAL EDUCATION — Unique opportunity available for Licensed Internist to coordinate University Affiliated Medical Resident Training Program for 273 licensed bed private hospital. Will also coordinate other specialty training programs; Medical Staff Continuing Education; and Rural Outreach Programs. Position available July 1, 1978. Attractive compensation and benefits commensurate with experience. Send resume and references to: Benji Goldfarb, M.D.; Chairman, Search Committee; c/o Administration; Mount Sinai Hospital; 2215 Park Avenue; Minneapolis, Minnesota 55404.

PSYCHIATRIC RESIDENCY: Vacancies for (PG2 through PG4 only) positions for July 1, 1978 for those who have a regular Iowa license or can obtain one by reciprocity or via FLEX. Prepare for career in private practice, community clinics or hospital based psychiatry. Emphasis on close supervision of intensive individual and group psychotherapy, OPD, Children's Unit, Adolescent Unit. Neurology affiliation with University of Iowa. The stipends are: 1st year, $22,360; 2nd year, $23,478; 3rd year $24,674. Intensity and diversity of training program appreciated best by personal visit. T. B. McManus, M.D., Superintendent, Mental Health Institute, Cherokee, Iowa 51012. Equal Opportunity Employer. Call collect 712-225-2594.

DIRECTOR, PROGRAM IN HUMAN SEXUALITY — University of Minnesota Medical School. Candidates wanted at once, M.D. or Ph.D. Contact John T. Kelly, M.D., Chairman, Search Committee, University of Minnesota, Department of Family Practice, Box 381 Mayo, 420 Delaware St. S.E., Minneapolis, MN 55455.

OFFICE SPACE TO SUBLET: Fully equipped space available immediately in the Meadowbrook Medical Building. Three examination rooms and shared consultation office included. Lab and X-ray facilities also available. 927-4071 after 2 P.M. except Friday.

OB-GYN, ANESTHESIOLOGIST and Orthopedic Surgeon to join progressive incorporated seven man group in Central Minnesota. 120 bed hospital. Lake area. Excellent leisure activities. Starting salary $40,000 per year. Contact Personnel Director, Little Falls Clinic, Little Falls, Minnesota. Telephone 612/ 632-3611.

MEDICAL DIRECTOR — Comprehensive out-patient rehabilitation center serving over 1,000 individuals per year including Physical Rehabilitation, Hearing and Speech, Developmental, and Vocational Rehabilitation programs seeks a dynamic physician to provide direct medical services to multiply handicapped children and adults, consultation to a multi-disciplinary team, coordination of services with the medical community, and participation in program evaluation and development.
Physician with experience in a rehabilitation setting or successful completion of a Physical Medicine and Rehabilitation residency is desired. Send resume to: Ronald Anderson, Executive Director; St. Paul Rehabilitation Center; 319 Eagle Street; St. Paul, Minnesota 55102. An Equal Opportunity Employer.

BOARD CERTIFIED. 32 year old family practitioner, seeking practice opportunity in small to medium-sized group in Minnesota or Wisconsin. Wife is pediatric nurse practitioner seeking work opportunity in same area. Available January 1979. Write: Minnesota Medicine — 534, 101 E. 5th Street, St. Paul 55101.

PHYSICIAN ASSISTANT: 26, married, grad. of Univ. of Nebr. Med. Center. Seeking employment in rural area with Family Practitioner. Available in May. Write Jay Pashalek, 115 N. 40th St., Omaha, Nebr. 68105 for resume.

APPLICATIONS WELCOMED from board-qualified or certified radiologists, large teaching hospital, upper Midwest; university affiliation, subspecialty training in pediatrics and/or therapy desirable. Box 529, MINNESOTA MEDICINE, 101 E. 5th St., St. Paul 55101.

ENJOY THE SECURITY OF GROUP PRACTICE WITH THE FREEDOM OF INDEPENDENT PRACTICE — If you are a Board Certified or Board Eligible internist, we have an interesting opportunity for you. Two or more internists are needed immediately to form an independent practice in a very desirable Northern Wisconsin community of 65,000. Active practice assured. All major specialists available for consultation. Business advice, technical and legal, will be provided. Outstanding personal benefit programs available. Income potential great. Generous starting income guaranteed. New 35 million dollar hospital to open in 12 months. For further information call Area Code 715 845-2942, or write P.O. Box 963, Wausau, Wisconsin 55401.

PHYSICIAN ASSISTANT to graduate from U of Neb. Med Center PA program May 78, who would like to return to Minn. to work. Call 402-556-4698 or write Robert Bacon, 4904 Chicago St., Omaha, Neb. 68132.

A TOUCH OF CLASS — Monticello Minn. estate for sale. 1200 feet of lake shore 5 wooded acres. Everything in this home is custom built or imported, from the hand split shakes to the imported light fixtures. There are 27 executive features about this home that you will have to see to enjoy. When you think of this estate, think total private living with swimming, fishing, and snow-mobiling. Your privacy to the world you deserve. Total Price $175,000.00, Phone (612) 441-2230 Larry Hennig Realty.

MMA 1978 Annual Meeting, Duluth, Minnesota

Recent Advances In Respiratory Disease

3 credit hours — Thursday, May 11

A course planned to acquaint physicians interested in pulmonary disease on either a primary treatment or consulting level with recent advances in the diagnosis and management of two common respiratory problems: chronic obstructive lung disease and the interstitial lung diseases.

INFECTION!
-a "dirty" word to surgeons...



...'ANCEF' helps "clean up" the site

'ANCEF' Offers Broad Coverage

of major areas of postsurgical infection due to susceptible indicated organisms (See Brief Summary below).

High, Prolonged Serum Levels Mean

most infections can be treated with 500 mg to 1 gram every 8 hours.

Cefazolin Levels in Tissues and Fluids*

'Ancef' is present in bone, synovial fluid, skin and soft tissues (such as pleural fluid and lymph nodes).

Before prescribing, see complete prescribing information in SK&F literature or *PDR*. The following is a brief summary.

Indications: Ancef® (sterile cefazolin sodium, SK&F) is indicated in the treatment of the following serious infections due to susceptible organisms.

Respiratory tract infections due to *Streptococcus (Diplococcus) pneumoniae, Klebsiella* species, *Hemophilus influenzae, Staphylococcus aureus* (penicillin-sensitive and penicillin-resistant), and group A beta-hemolytic streptococci.

Injectable benzathine penicillin is considered to be the drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever.

'Ancef' is effective in the eradication of streptococci from the nasopharynx; however, data establishing the efficacy of 'Ancef' in the subsequent prevention of rheumatic fever are not available at present.

Genitourinary tract infections due to *Escherichia coli, Proteus mirabilis, Klebsiella* species, and some strains of enterobacter and enterococci.

Skin and soft-tissue infections due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci and other strains of streptococci.

Bone and joint infections due to *S. aureus.*

Septicemia due to *Str. pneumoniae, S. aureus* (penicillin-sensitive and penicillin-resistant), *P. mirabilis, E. coli,* and *Klebsiella* species.

Endocarditis due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci.

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to 'Ancef'.

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Usage in Pregnancy—Safety of this product for use during pregnancy has not been established.

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Precautions: Prolonged use of 'Ancef' may result in the overgrowth of nonsusceptible organisms. Careful clinical observation of the patient is essential.

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See the package literature for dosage recommendations.

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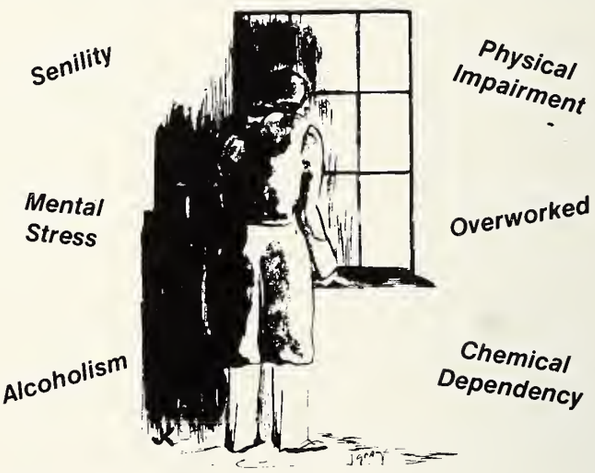
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Readers and Reviewers: The right is reserved to reject material submitted for reading or advertising columns. The views expressed in this journal do not necessarily represent those of the Minnesota Medical Association nor any of its constituents.

Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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President's Letter



Communications — Everybody's Problem

Physicians for the most part are doing an excellent job of practicing medicine — of taking care of their patients. Most of them feel that is enough to keep the public satisfied, the politicians out of their hair, and the media writing reports on their good work. Unfortunately, just as we are told good works alone will not get us into heaven, so also good works alone will not guarantee us the privilege of practicing quality medicine in the future without volume upon volume of rules, regulations, and controls by politicians at all levels.

We have to, in other words, learn how to communicate with: (1) our patients, (2) our fellow physicians, (3) the media, and (4) the public in general. Public relations is a highly specialized and productive profession, and we must learn from and follow the advise of those who have expertise in that field. Your State Organization recognized the importance of that entire field and hired a full-time expert one year ago to help us all in that field. Jim Kosmo, although in our employ about one year, has helped us all tremendously and is setting up programs that will, I am sure, bear fruit in the future. A great deal of what follows comes from comments and suggestions made by Jim in a letter to the head of one of our specialty societies.

He asked some questions: "Are you interested in where you practice? How you practice? What portions of your profession will be turned over to less costly professionals? Should your specialty continue to exist as a profession?" These questions do not just apply to that one specialty. They apply to all of medicine, for the challenge to medicine is being seen on all fronts, and we must, all of us, get into the act of meeting that challenge.

As an example, there was a major thrust under the guise of aiding cost control to amend the certificate of need law to include physicians' offices in the last session of the legislature. Because, this time the troops (legislative contacts) really went to work and communicated with their legislators, the bill was defeated better than 2 to 1 in the House and 60 to 40 in the Senate. This was labeled a cost containment measure despite the fact that government itself (HEW) has conceded the certificate of need failed to control costs. Why then is government still pushing certificate of need? What better way to extend control of the government to the practice of medicine? First limit is what you can buy in your office (anything over $150,000 would have had to meet a certificate of need). Then it would expand that control to the types of services you can provide, where you can practice, how you will be compensated, what medications you can use: all under the guise of cost containment. Your profession recognized the potential and really went to work, via proper communications, at all levels on this one and the result was gratifying. It not only surprised some of us, but also showed us what really can be accomplished with a well thought out campaign properly executed!

If the proponents of socialized medicine and a massive national health insurance plot are unsuccessful, certificate of need controls on physicians can provide the same end result. We, as a profession, are not out of the woods by any means, for Congressman Paul Rogers of the Congress is attempting to get certificate of need into national health legislation. We must, as a profession, communicate adequately with our congressmen to defeat this legislation at the

national level. The same arguments given at the state level apply at the national level. Contact the State Office and ask for the facts, then write your congressmen. Communicate on a one-to-one basis.

All of you were made aware of the full power of proper communications when the first HEW guidelines were published in September of 1977. In that instance we were helped by our allies — the small town newspapers and the people, our patients, themselves. The information was provided by HEW, but it raised such a cry among our patients that the congress passed a resolution without a dissenting vote to nullify those specific rules and regulations of HEW.

This should be lesson for all of us. Communicate with our patients and get their cooperation in this battle against government rule, regulation, and control. We must take time from our busy practices to communicate with our patients in the confines of our offices.

Although it has slipped, public confidence in physicians remains high, and the medical profession continues to practice good medicine. Thus, you do indeed have a good service to sell. You can go to the public and get their cooperation. If you treat them well, thoughtfully, with personal consideration, they will work with you in an attempt to maintain that type of service. But they will not do it unless you ask them.

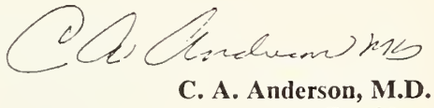
Last August your Board of Trustees held a "Think Session" covering many aspects of organized medicine. One of the priorities coming out of that session was to improve communications with the media throughout the state and to improve communications between physicians and patients. One practical idea to come out will soon take effect. During April of this year meetings will be held in the various Trustee Districts. At that time members of the State Association's staff, your state officers and, your trustee from your area will be there to present various programs of the Association and allow you to ask questions.

Efforts are being made to distribute health education materials through the monthly MMA statewide news service. The "Dr. Tell Me" radio program is being presented throughout the state. Monitoring and having input into the health Planning process is being provided in all of the Health Service Areas. Public appearances on radio and TV talk shows have been and are being arranged. Legislative contacts are being urged and promoted at all levels. Service organizations are being provided with speakers. All of these things are an attempt to counteract the anti-physician propaganda that is being distributed by a number of organizations. They all entail communication efforts, and they all entail your cooperation and personal effort.

All of these organized efforts are important and helpful, but you are the most important link in the entire communication effort. First, communicate with your Association to get the facts you need and then communicate personally with your legislators, congressmen or senators. Most important of all communicate with your patients on the medical political problems concerning you and ask them to communicate with their legislators, congressmen and senators. You do practice quality medicine; you have concern for your patients; and you have enough empathy with them so that they know this. You reaffirm this by your daily interest and care, and you can ask them to help you maintain and continue this type of personal care. It takes a conscientious effort on your part all of the time.

A little gimmick I have used. Keep postcards in your office addressed to your congressmen. After communicating with your patients regarding a problem, hand them a postcard and ask them if they would write their legislators, congressmen or senators on that particular problem. By doing so you are spreading your communications exposure.

We must all of us become communications experts. Good deeds alone are not enough.



C. A. Anderson, M.D.
President

Editor's Notebook

VA at the Crossroads?

"The veterans' health care system stands at a crossroads. With the likelihood that a national health insurance scheme will be enacted soon, the future of a separate veterans' health care system is in question."

Michael Lipsky et al.
"The Future of the Veterans' Health Care System"
Journal of Health Politics, Policy and Law
Volume 1, 285-294, Fall, 1976

Outside of its psychiatric and rural institutions, most VA system hospitals affiliate themselves with university health science centers. Perhaps half the readers of this editorial received part or all of their training at a VA hospital. Consequently, many of you will be interested in the crossfire over the future of the VA which I was recently caught up in at a alumni seminar of the Harvard Program on Health Systems Management. As the VA approaches a possible crossroads in its existence, you are likely to encounter even more sniping on all sides of the VA issue.

Editorial

In December 1977, I wrote an editorial "Health Care Cost Containment: Management, Politics, and Medicne".[1] If you remember, the editorial described the content and participant reactions to a cost containment seminar. That editorial contained this passage:

"During the last part of the seminar, an HEW representative, up from Washington for the occasion, was asked why the Carter Administration did not include Veteran Administration hospitals under its Cost Containment Bill. When the HEW man cavalierly brushed off the question by saying: 'Too politically sensitive,' he was hooted down.

"I have cited these examples, because I think they illustrate a few of the Carter Administration's problems with health legislation.

"First, there is the credibility problem. The Administration has swung a meat ax at private voluntary hospitals; yet it blithely ignores the 171 Veterans' hospitals and other federal hospitals. These hospitals have roughly twice the per diem costs and twice the hospital stay as private hospitals."

Response to Editorial

My words did not go unheeded. One of my fellow alumnus who attended the seminar, Mr. Edward M. Friedlander, currently a special assistant of the Department of Medicine and Surgery in the Office of Academic Affairs of the Veterans' Administration in Washington, D.C., read my passage and fired off an informal reply to me on his personal stationery:

"For a physician you're a darn good reporter . . . But reporters aren't always competent in all areas, particularly scientific reporters who try to understand and report politics — and I'm afraid that's where you missed somewhat in your report . . . What I think you missed were my few observations on his reply. First, I pointed out that together the VA and the Department of Defense represent some $10 billion a year in terms of what they spend in their health programs — more than DHEW has left to spend after Medicare and Medicaid; Secondly, I pointed out the interdependence the private sector has on those two systems — especially the VA — in both the amount they pick up the tab for from the state and the community, and especially the contribution they make in the development of health manpower (the VA alone, as you know, funds in excess of 7,000 residencies each year); thirdly, that because both the VA and Department of Defense legislation and budgets are dealt with by other Congressional Committees and are independent of the DHEW, Mr. Califano has no jurisdiction or authority over them anyway; and finally, if he tried to take on any such responsibility, it would result in a terrible political bru-ha-ha.

"As for your observation about the VA's statistics and function as related to the country's other health care system, I would call your attention and invite your reading of the attached reprint which I had a hand in writing back in 1972."[2]

VA Special Medical Advisory Group Report

What Mr. Friedlander sent me was a report published in the *Journal of the AMERICAN MEDICAL ASSOCIATION* from the Special Medical Advisory Group — a committee that the Chief Medical Director had nominated and which included Doctor William Bickel of the Mayo Clinic and Doctor Lyle French of the University of Minnesota Medical School.[2] The report listed these strengths and potentials of the VA System: it has existed for 25 years and represents a $50 billion dollar investment; it "can be expected to continue"; "it is not only essentially a prepayment system for veterans but a functional system for the delivery of care"; it provides "geographic accessibility," within 100 miles or a two hour drive of 90 percent of veterans; it could be the nucleus of a network of regional centers; this regionalization permits "a minimum of expensive duplication and a maximum potential for integration with health facilities in the public and private sector"; the system is flexible and has large educational and training capabilities; the autonomy and resources of the VA permit an experimental and innovative approach; its centralized administration permits cooperative purchasing and distribution techniques for supplies; the populations it serves allow the VA to accumulate a "health data base"; the VA system permits "the widest possible latitude in modes of patient care", and its "one-class service for all patients provides a model to help meet the current demand for equity and equality to match efficiency and economy in the total health care system".

Other Sides

And so, I trust I have given sufficient space for Mr. Friedlander to present his side of the argument. There are other sides. Lipsky et al., a group of political scientists, propose the "VA become a model system for the care of the chronically ill, the alcoholic, and the aged whose needs tend to be neglected by the overall health system.[13] This view, I'm sure, will not sit well with the academic establishment. A Ralph Nader Group and the American Enterprise Institute argue that a separate veterans' hospital system be abolished and absorbed into the overall health system.[4] This is what has happened in England and Canada when national health schemes has been introduced.

Private Side

There is another side — that of private medicine and its attitude towards government regulation of the private sector. From the tone of Mr. Friedlander's letter, I gather he is happy the VA is outside the jurisdiction of Mr. Califano and HEW. Yet, why should the VA be outside this jurisdiction? Until now, the health reform movement in the United States has consisted of these elements: Professional Standards Review Organizations, utilization review structures, more laymen in decision making roles, and limited government expenditures for health. If these elements are to be imposed on the private sector, why should they not be imposed on the VA? Why should not the length of stay in the VA be monitored and limited as it is in private hospitals? In short, if we are going to limit expenditures in the private sector, why not in the public sector?

Sounding Board

Given these questions, you may find it instructive to read the March 16, 1978 "Sounding Board Section" of the *New England Journal of Medicine*.[5,6,7] The Editor of the Journal, Arnold S. Relman, publishes two points of view; one by Eli Ginzberg, PhD, a health economist at Columbia University, and the other by Saul Farber, M.D., of the New York University School of Medicine, who chaired a 21-member National Academy of Science

Committee, and who issued an important study on Health Care of American Veterans.[7] The report of Farber's Committee was given to the VA, who responded to their report and since then has ignored the issue.[8]

As Mr. Relman points out, both the House and Senate will probably follow the VA pattern, i.e. nothing will happen. Why? To use Doctor Relman's words: "The fact is that the VA medical care-system is a sacred cow. The whole subject is so loaded with political emotion and vested interests that rational public discourse is hardly possible."

I found Professor Ginzberg's arguments particularly compelling. He says: "the committee sees national health insurance as just around the corner. I do not. It has been on and off the nation's agenda since 1912, and it is difficult to identify the political consensus required to turn it from plan into reality. Morever in the face of budgetary stringency and burdensome Social Security taxes, it is difficult to see how, even if national insurance were enacted, it would provide much in the way of additional services to the poor or near poor."[6]

Doctor Ginzberg is a social scientist with three decades of participating in health policy debates. He is especially adept at analyzing power relationships among health groups and the government. As he has said elsewhere: "There are simply too many interacting variables to permit even the most skillful analysts to anticipate all future developments."[10]

Conclusion

Because of the rising tide of conservatism in the country, the existing power of physicians, hospitals, and other health professionals, the public's concern over the rising tax burden, particularly the latest Social Security taxes and the middle class being placed in higher brackets through inflation, it is likely that National Health Insurance will not be passed soon, or if it is, it will be modest and will cover only catastrophic illness. Most of the present talk about the future of the VA assumes: (1) National Health Insurance will soon pass; and (2) this passage will fundamentally alter the VA. Both assumptions are premature.



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BRIEF SUMMARY

Indications: Oral potassium therapy for the prevention and treatment of hypokalemia which may occur secondary to diuretic or corticosteroid administration. May be used in the treatment of cardiac arrhythmias due to digitalis intoxication.

Contraindications: Severe renal impairment with oliguria or azotemia, untreated Addison's disease, adynamia episodica hereditaria, acute dehydration, heat cramps and hyperkalemia from any cause.

Precautions: Potassium intoxication by oral administration rarely occurs in patients with normal kidney function, however, potassium supplements must be administered with caution, since the amount of the deficiency or daily dosage is not accurately known. Frequent checks of the clinical status of the patient, and periodic ECG and/or serum potassium levels should be made. High serum concentrations of potassium ion may cause death through cardiac depression, arrhythmias or arrest. This drug should be used with caution in the presence of cardiac disease.

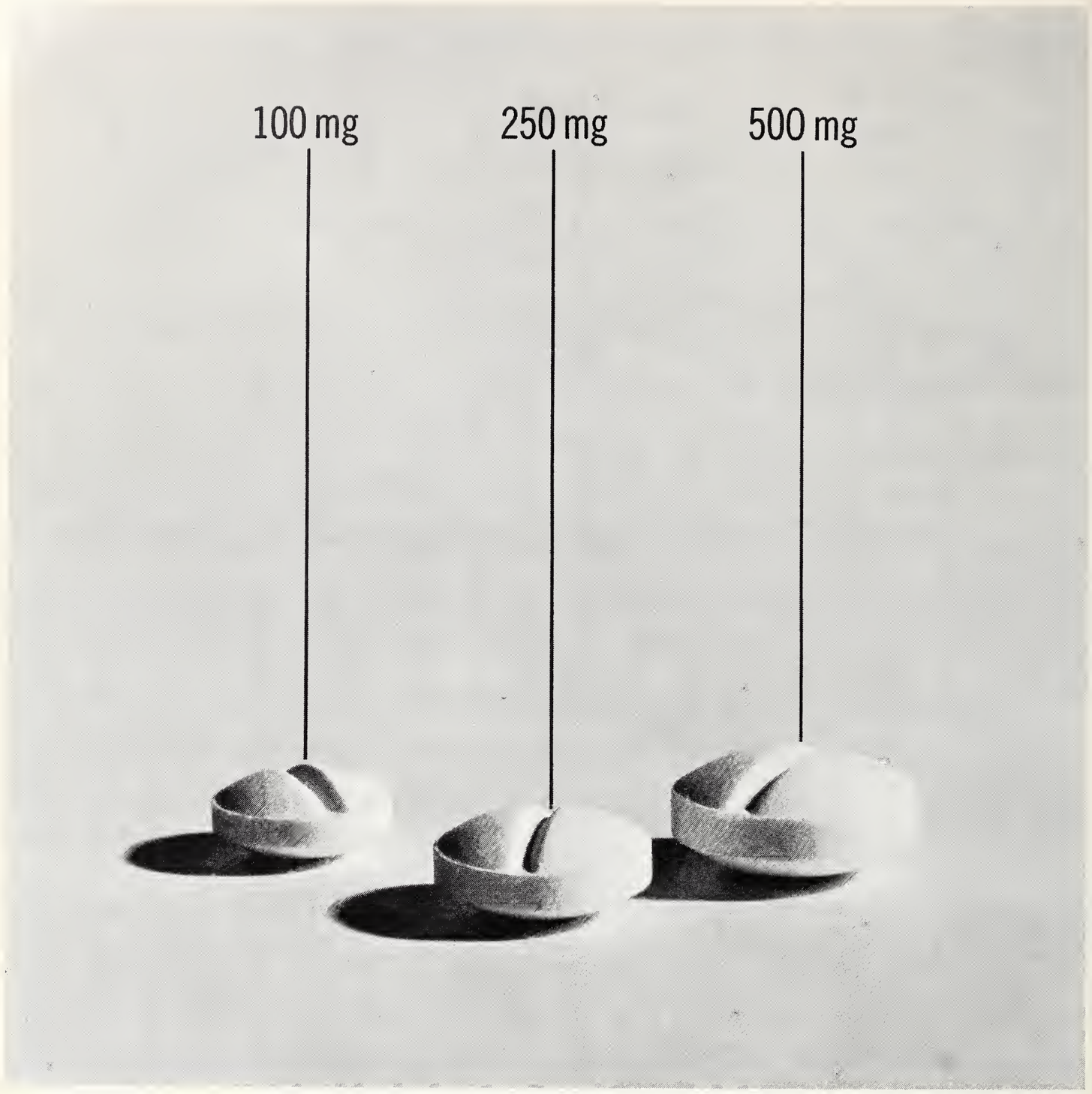
In hypokalemic states, especially in patients on a low-salt diet, hypochloremic alkalosis is a possibility that may require chloride as well as potassium supplementation.

Adverse Reactions: Nausea, vomiting, diarrhea, and abdominal discomfort have been reported. The most severe adverse effect is hyperkalemia.

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Multiple Thromboses in Polycythemia Vera

JOHN N. MORK, M.D.,* and JOHN F. BARLOW, M.D.†

Fatal, multiple thromboses occurred in a patient with polycythemia vera (PV). Notable features included a striking decrease in the platelet count seven days prior to death. There was a paucity of symptoms and signs until the last 24 hours of life.

In PV a sudden, precipitous decrease in platelet count, even without symptoms, may be an indication for prompt anticoagulation. This case report demonstrates the need to control elevated platelet counts early in the course of PV.

THERE IS LITTLE ATTENTION given to the role of platelets in the thrombotic complications of PV in the literature. Perhaps this is because of the widely recognized decreased platelet function in PV or the importance given to the role of increased viscosity.

In the case we present, platelet counts were closely observed throughout an unusual, prolonged and fatal intravascular coagulation involving multiple large vessels in a patient with PV.

Case Report

A sixty-three year old woman was treated for documented‡ PV from June 19 through July 18, 1973 by repeated phlebotomies (Figure). She led an active life until August 21, 1973 when she entered the Worthington Regional Hospital with a left hemiparesis.

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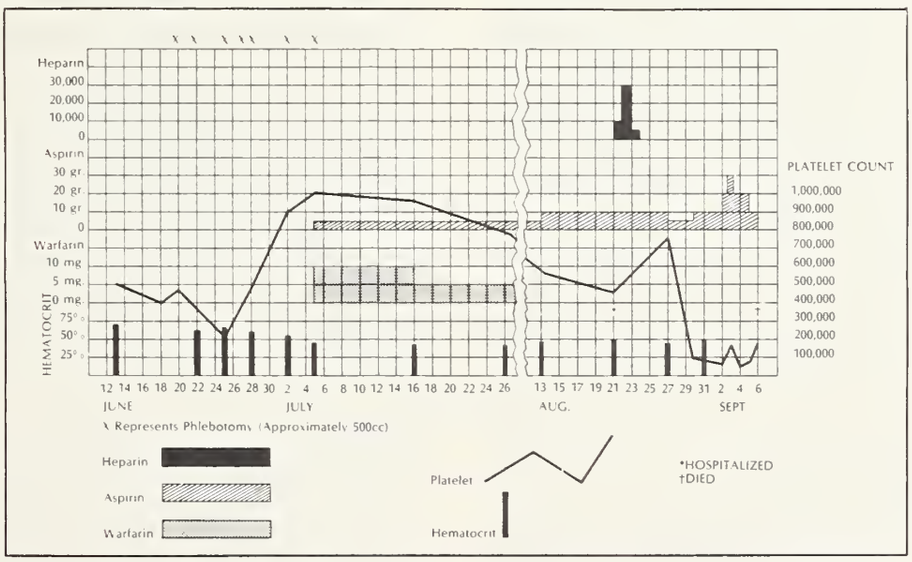
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‡Hgb. 23.6 gm %, Hct. 73%, leukocytosis, thrombocytosis, panhyperplasia on bone marrow examination and increased red cell mass by Chromium^{51} study.

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Platelet levels were followed during hospitalization (Figure). Nine days after admission, when the patient was slowly recovering from the stroke, platelet counts decreased from 761,000 to 130,000 mm^{-3} without explanation. Two days later she developed left shoulder pain. Five days later she became tachypneic. The next day her electrocardiogram showed loss of R-waves in standard leads II and III and chest Xray showed slight cardiac enlargement. She was transferred to the coronary care unit. Intravascular coagulation was suspected because of the prior low platelet counts and the patient's deteriorating cardiorespiratory status. The following studies were obtained: prothrombin time 14.0 seconds (control 11.8 seconds), plasma fibrinogen 163 mg dl^{-1} (normal values 170-410 mg dl^{-1}), fibrin split products 80 mcg ml^{-1} (normal up to 7 mcg ml^{-1}). Platelet count was 161,000 mm^{-3}. 10,000 units of heparin were given. Within an hour of transfer to the coronary care unit, the patient suffered a cardiac arrest and died.

Autopsy findings are summarized as follows: A 3 cm recent infarction was present in the right occipital lobe of the brain. A thrombosed cerebral vein was seen coursing over the left parietal temporal region. There was moderate cerebrovascular atherosclerosis and a few cystic areas with surrounding gliosis near the recent infarction in the right occipital lobe. In spite of minimal



Figure—A diagrammatic representation of several hematologic measurements during the course of this patient's illness. Also shown are treatment events which appeared to influence the course of the illness.

coronary atherosclerosis, there were recent and organizing thrombi in both main coronary arteries. A recent myocardial infarction was seen grossly and microscopically in the posterior left ventricular wall involving the posterior septum. The lungs contained multiple adherent thrombi in the pulmonary arteries. There was complete occlusion of both main stem pulmonary arteries by friable red-black premortem thrombi. This was accompanied by multiple bilateral pulmonary infarctions which had typical wedge-shaped hemorrhagic appearance. No thrombi were found in the iliac veins, right heart or vena cava but calf veins were not examined. There was a small recent right renal vein thrombus. The spleen weighed 600 gms. There was no evidence of extramedullary hematopoiesis in the spleen or liver. The bone marrow showed marked panhyperplasia. There was an absence of hemorrhage into tissues or effusions into body cavities. No recognized causes of secondary PV were discovered at autopsy.

Discussion

Platelets have been studied extensively in PV but their role in the pathogenesis of the complications of thrombosis and hemorrhage is unclear.[1,3,8] A recent review stated that increased blood viscosity and vascular distension due to hypervolemia is the major cause of thrombosis and hemorrhage in PV; also, "the modest degree of thrombocytosis seen in PV is in itself not sufficient to cause this complication."[3] Even though it is known that the platelet count is elevated in 60% of patients with PV and is over 1,000,000 mm^{-3} in 9% of these patients, abnormal platelet function leading to hemorrhage has been stressed rather than the thrombocytosis causing thrombosis.

For unknown reasons our patient's platelets functioned well enough to participate in formation of multiple thromboses. This occurred in spite of the hematocrit remaining consistently below 55-60 ml dl^{-1}, the level above which blood viscosity increases.[4] The remarkable number of arterial thromboses occurring in spite of minimal atherosclerosis and no recognized precipitating event prompted this report.

The case report presented here demonstrated intravascular coagulation but did not fit into the acute, diffuse intravascular coagulation (DIC) category. Rather, the intravascular coagulation took place in a more indolent manner with minimal clinical manifestations. It also involved large vessels rather than the microvasculature usually involved in acute DIC. There are other case reports of PV with generalized intravascular coagulation. One patient's course lasted for years.[2] Two other patients had typical acute, DIC.[1,9] Our patient's case was subacute lasting 17 days. Increased fibrin split products, prolonged prothrombin time and decreased fibrinogen indicated the severity of the process terminally.

Platelet counts 100,000 to 160,000 mm^{-3} are generally not considered to be life threatening. In this case these platelet counts represented a dramatic fall from previously elevated levels. We believe that this fall in platelet count represented the unrecognized onset of the thrombotic process in this patient.

The factor or factors which triggered the thrombotic process in our patient are puzzling. Perhaps the withdrawal of heparin was a precipitating factor. The platelet levels rose to a peak three days after the withdrawal of heparin and then fell precipitously two days later. Release of thromboplastin from the cerebral infarction site seems unlikely to have initiated this chain of events. There remains the possibility that the thrombotic process began simply as a result of the greatly increased number of circulating platelets with intravascular clumping of platelets as the initial event.

The low dose aspirin therapy given for anti-platelet aggregation effect may have slowed the intravascular coagulation. In recent case reports, aspirin as well as dipyridamole were effective in reversing symptomatic DIC in PV.[1,9,10]

Effective treatment of thromboses in PV may be possible if prompt recognition of acute or subacute intravascular coagulation can be facilitated by platelet count monitoring. A sudden decrease in platelet count is an indication to search for evidence of intravascular coagulation. A sudden decrease in platelet count may be the sole indication for anticoagulant therapy in PV.

Platelet function studies offer a rational basis for selecting which patients with PV should receive "chemotherapy." However, at present, there are insufficient data to indicate which platelet function studies are reliable predictors of hemorrhagic and thrombotic complications of thrombocytosis in PV.

Radioactive phosphorus, busulfan or uracil mustard are generally effective in controlling thrombocytosis in PV. We believe that the fatal thrombosis in our patient might not have occurred if the platelet count had been brought to a normal level as part of the initial treatment.

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Spontaneous Recovery from Adrenocortical Insufficiency

G. E. COTTON, M.D.*

A case of adrenocortical insufficiency documented by five days of intense ACTH stimulation developed in close temporal relationship to a severe systemic illness (granulomatous colitis) in a 43-year-old man. Spontaneous recovery occurred in the two years following diagnosis. It is suggested that in similar cases periodic retesting for evidence of recovery of adrenocortical function be carried out.

SPONTANEOUSLY DEVELOPING adrenocortical insufficiency is ordinarily a permanent condition requiring life-long replacement with glucocorticoid and often mineralocorticoid adrenocortical hormones. The diagnosis of adrenocortical insufficiency depends upon demonstration of adrenal unresponsiveness to ACTH stimulation,[1,2] and while the duration of stimulation required to establish the diagnosis in a patient who has had prolonged suppression of the hypothalamo-pituitary-adrenal axis due to long-term exogenous steroid therapy is somewhat controversial[3], daily stimulation with ACTH for a period of five to seven days with no apparent adrenal response is persuasive evidence that permanent adrenocortical insufficiency may be present.

The following is a case in which adrenocortical insufficiency, documented by five days of intense ACTH stimulation, was followed by spontaneous recovery over a period of two years.

Case Report

This 43-year-old white male was in good health until June of 1968. At that time, he developed rectal bleeding, 10-12 bloody stools per day, fever, fatigue and weight loss. Abdominal tenderness was noted upon examination. He was anemic, hypoproteinemic, and a prolonged prothrombin time and "abnormal" electrolytes were noted. Proctoscopic examination and barium enema studies were compatible with the diagnosis of acute ulcerative colitis. The patient responded to a total of 160 mg. of prednisone p.o. given over a nine-day period beginning June 27, 1968; and a total of 18 hydrocortisone retention enemas (Cortenema). He was then treated with salicylazosulfapyridine, eight grams per day with a decrease in the number of stools to two to three per day along with mild rectal bleeding. His course remained stable until approximately January 7, 1969 when he again developed spiking daily fevers, anorexia, fatigue, weakness and a marked increase in frequency of bloody stools. Diffuse gastrointestinal bleeding with resultant anemia led to transfusion with three units of whole blood. He was placed on prednisone, 60 mg. daily, and again received a total of 10 hydrocortisone retention enemas over the following two weeks. The patient continued to deteriorate, and his weight decreased from 150 lbs. down to 97 lbs. On March 18, 1969, he underwent a total proctocolectomy. Pathologic diagnosis was "granulomatous colitis".

Post-operatively, continued weakness and anorexia associated with mental depression and discouragement on the part of the patient was manifested. He made a prompt improvement with intravenous saline and glucocorticoids. The wounds healed well, and the ileostomy function was quite satisfactory with approximately 600 cc. of liquid stool per day. He was dismissed from the hospital on May 2, 1969, at which time his serum sodium was 135 meq/liter, potassium 5.5 meq/liter, and his hemoglobin, serum calcium and serum protein electrophoresis were within normal limits. Prednisone, 5 mg. per day, was recommended until he "felt more confident in himself". The patient states that he did not take this medication between the dates of May 2nd and June 5, 1969, at which time he was again seen and readmitted to the hospital. He complained chiefly of weakness, anorexia and fatigability. The patient's wife stated that she felt his freckles were becoming darker and his skin more pigmented. Chief physical findings at that time included a supine blood pressure of 98/80, dropping to 84/64 upon standing. The wounds were well healed, and the ileostomy was functioning well. Serum sodium was 126 meq/liter, potassium 7.5 meq/liter, and chloride 99 meq/liter. He responded promptly to intravenous administration of physiologic saline and

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dexamethasone. Beginning June 5, 1969, ACTH 40 units were given intravenously over a period of eight hours each day for a total of five days. The results are shown in Table 1.

TABLE 1

June 5, 1969

(ACTH 40 units i.v. daily - 1000 ml. NS/8 Hours)

Base line Day	Plasma Corticosteroids 8 A.M. μg/100 ml.	4 P.M. μg/100 ml.	Urinary Steroids/24 Hours 17 KS mg.*	17 KGS mg.†
1	2.4	0.7	1.9	3.0
2	2.7	—	2.3	3.2
3	0.4	3.2	1.5	3.5
4	2.5	4.1	2.2	2.7
5	1.3	3.3	2.4	2.7
	Nil	3.6	1.5	1.9

Normal 8 a.m. 7-28 μg.%
4 p.m. 2-18 μg.%

Normal 17 KS 6-21 mg/24 Hours
17 KGS 4-14 mg/24 Hours

*7 ketosteroids
†17 ketogenic steroids

Therapy with 10 mg. of hydrocortisone acetate every eight hours p.o. along with .1 mg. of 9 alphafluorohydrocortisone once daily p.o. was initiated with prompt clinical recovery.

The patient was first seen by the author on October 30, 1970 at which time he was feeling well and desired a routine periodic examination. He was taking 10 mg. of hydrocortisone every eight hours and a .1 mg. of 9 alphafluorohydrocortisone daily. He stated that he had "never felt quite this well in my life". The ileostomy was functioning well, and his weight was now 150 lbs. (Ideal weight 140 lbs.) Clinical examination revealed a healthy-appearing, very relaxed 46-year-old man in no distress. Pulse was 72. Temperature was 37° C. Blood pressure was 172/106 sitting and 150/110 standing. The ileostomy appeared normal, and the remainder of the physical examination was entirely within normal limits.

Hemoglobin was 16.7 gms. %, erythrocytic sedimentation rate was 5 mm./hr (Westergren method), white blood cell count was 9,850 with a normal differential and urinalysis was within normal limits. Serum potassium was 4.6 meq/liter and sodium 146 meq/liter. Repeat blood pressure measurement in November of 1970 was 186/110. The 9 alpha-fluorohydrocortisone was decreased to .05 mg. daily, and one month later the blood pressure was 150/90. In March of 1971, the blood pressure was 166/106. The 9 alphafluorohydrocortisone was gradually reduced and discontinued in May of 1971. Hypertension persisted with blood pressure readings from 170-150/96-100 despite restriction of dietary sodium to 2 gms. daily. The patient continued to feel well, and the dosage of hydrocortisone acetate was slowly tapered and completely discontinued in July of 1971. The patient had no clinical symptoms of adrenal insufficiency, and the blood pressure remained 154/90.

In September of 1971, the patient was asymptomatic, and further studies showed blood pressure readings ranging from 116-146/80-94. Physical examination was within normal limits. The serum sodium was 139 meq/liter, and potassium 4.7 meq/liter. Adrenal stimulation was carried out with an intravenous infusion of cosyntropin .25 mg. over an eight hour period. The normal basal plasma cortisols with mild stimulatability of the plasma cortisols without appreciable change in urinary 17 KS and 17 KGS are shown in Table 2.

TABLE 2

(cosyntropin 0.24 mg. i.v. — 1000 ml. NS/8 Hours)

Baseline Day	Plasma Corticosteroids 8 A.M. μ/100 ml.	4 P.M. μ/100 ml.	Urinary Steroids/24 Hours 17 KS	17 KGS
	17.0	8.5	2.0	6.8
1	21	20.5	2.2	6.0
2	24	17.5	2.3	8.0
3	27.5	—	—	—

Normal 8 a.m. 10.0-25.6 μ/100 ml.
4 p.m. 5.2-17.6 μg/100 ml.

Normal 17 KS 6-21 mg/24 Hours
17 KGS 4-14 mg/24 Hours

Between September 1971 and January 1973, the patient remained in good health off all adrenocortical replacement. He underwent a left inguinal herniorrhaphy during which supplemental glucocorticoids were given, and the course was uneventful. Blood pressure while hospitalized ranged from 146/100 to 170/100. Serum sodium was 141, and potassium 5 meq/liter. This mild hypertension was sustained, and on February 1, 1974, he was started on triamterine 50 mg. and hydrochlorothiazide 25 mg. (Dyazide). The serum electrolytes remained normal, and the blood pressure following therapy reached 150/90.

In January 1973, the patient was given 2 mg. of dexamethasone at 11 p.m., and the following morning at 8 a.m. the plasma cortisol was 6.6 μg%. Two injections of ACTH 40 units intramuscularly were given at 12 hour intervals resulting in a mild increase of 17 KS and 17 KGS as shown in Table 3. The patient's weight stabilized at 149 lbs., and blood pressure ranged from 150/90 to 170/100.

In May of 1975, again following 2 mg. of dexamethasone at 11 p.m. the plasma cortisol was 4.2 μg% the following morning at 8 a.m. He was then given ACTH gel 40 units i.m. every 12 hours, and the 8 a.m. cortisols on the following two days were 29 and 22 μg%. Twenty-four hour urinary aldosterone

was 5 μg., but unfortunately the urinary electrolytes were not recorded simultaneously.

TABLE 3

(ACTH 40 units i.m. every 12 Hours)

	Plasma Corticosteroids		Urinary Steroids	
Day	8 A.M. μg/100 ml.	4 P.M. μg/100 ml.	17 KS	17 KGS
1	—	5.5	3.0	8.7
2	11.8	—	3.9	10.3

Normal 8 a.m. 10.0-25.6 μg/100 ml. 4 p.m. 5.2-17.6 μg/100 ml.

Normal 17 KS 6-21 mg/24 Hours 17 KGS 4-14 mg/24 Hours

This patient continues to feel well, and his physical examination is normal. His hypertension is now well controlled with mild sodium restriction and a thiazide diuretic given b.i.d. A serum ACTH level on 8-3-76 was 109 pg/ml (normal up to 80).

Discussion

A patient with adrenocortical insufficiency documented by unresponsiveness to five days of intense ACTH stimulation, in whom spontaneous recovery occurred over a period of two years, is presented. Initial manifestations of adrenocortical insufficiency occurred in close temporal association with a severe systemic illness, namely acute granulomatous colitis.

Associated with an acute exacerbation of his inflammatory bowel disease in January 1969, gastrointestinal bleeding required transfusion of three units of whole blood. A note in the medical record at that time stated that "bloody fluid was returned on aspiration from a nasogastric tube," and also that bloody stools were noted, indicating that the bleeding was not confined to the colon but was diffuse. This raises the speculation that diffuse bleeding was caused by a generalized disorder of coagulation, possibly disseminated intravascular coagulation. Coagulation studies were not recorded.

The occurrence of disseminated intravascular coagulation in patients with inflammatory bowel disease is exceedingly rare; a single case having been reported,[12] and additional transient mention of its occurrence in a review of disseminated intravascular coagulation.[14] On the other hand, disseminated intravascular coagulation is commonly seen in association with bactermic states,[13,15] which are not infrequently associated with severe inflammatory bowel disease. The occurrence of acute adrenal hemorrhage in patients with disseminated intravascular coagulation is well documented and may have been responsible for near total destruction of the adrenal glands in this patient. Glucocorticoid therapy in pharmacologic doses and pre-operative adrenocortical steroid supplements prevented recognition of the adrenocortical insufficiency until steroid therapy was withdrawn post-operatively. At that time, clinical adrenocortical insufficiency was recognized and responded nicely to appropriate replacement therapy. Some remnant of the adrenal cortices undoubtedly persisted, and eventually regenerative hyperplasia occurred with resultant partial recovery of adrenocortical function sufficient to allow withdrawal of replacement therapy.

Recognition of recovery of adrenocortical function in a patient taking replacement therapy for chronic adrenocortical insufficiency is difficult at best, and under usual circumstances is not considered. In this patient, the development of hypertension, thought initially to be due to mineralocorticoid excess but persisting once the mineralocorticoid was discontinued, was suggestive that some recovery of adrenocortical function had occurred. Under close observation, withdrawal of glucocorticoid therapy was then accomplished without incident in this cooperative, reliable patient. Subsequent laboratory studies, although incomplete, established that partial adrenocortical recovery had occurred as indicated by normal basal plasma cortisols, a return of diurnal variation and sub-optimal but definite response to ACTH, and suppressibility by dexamethasone. A single ACTH level is minimally elevated, possibly indicating either a limited adrenocortical reserve with normal levels of glucocorticoids being provided by excess ACTH stimulation, or alternatively, as ACTH is normally released in short pulsatile bursts, that the peak of a pulse of ACTH release may have occurred virtually simultaneously with the time that the blood specimen was drawn.

Glucocorticoid therapy has long been established as suppressive to the hypothalamic-pituitary-adrenal axis. The amount of glucocorticoid given and the degree of treatment in this case, however, seem an unlikely explanation for the duration of adrenocortical unresponsiveness to ACTH noted initially in this patient. Kyle has commented upon the remarkable duration of contralateral adrenocortical unresponsiveness after removal of a functioning adrenal tumor, stating that in one of his patients complete unresponsiveness to ACTH given intravenously for seven days was noted. This test was repeated "about once a month for the first year, twice a month for the second year, and after having almost given up three years after his operation, seven days of ACTH finally gave a flicker of response. With no more treatment he went on to

regain perfectly normal function"[5]. The fact that recovery of adrenal function following long-term adrenal suppression from any cause may be quite delayed is now established. In short-term suppression, as occurred in this patient, recovery is ordinarily quite prompt.

In slowly developing, spontaneously occurring cases of adrenal insufficiency, spontaneous recovery of adrenal function has occurred rarely. A case of Addison's Disease with partial recovery was reported by Nordin in 1955,[5] and Annear and Baker in 1961[6] reported a case of tuberculosis Addison's Disease with apparent cure by chemotherapy. In each of the above cases, the clinical picture and laboratory data were consistent with the diagnosis of Addison's Disease but the diagnosis was not established beyond doubt.

This case demonstrates recovery of adrenocortical function in a patient in whom the diagnosis of adrenocortical insufficiency was documented by unresponsiveness to intense ACTH stimulation. Therefore, it is suggested that patients in whom adrenocortical insufficiency develops in close association with an overwhelming systemic illness, particularly one in which adrenal hemorrhage may have occurred as part of a process of disseminated intravascular coagulation, the possibility of regenerative hyperplasia of the glandular remnants should be considered. Recovery to the point that life-long replacement therapy is unnecessary is unusual, but that it occurs is clearly indicated by this case. Periodic retesting with ACTH stimulation is recommended in selected cases to identify those in whom withdrawal of replacement therapy may be possible. The limited adrenocortical reserve in these patients makes it prudent to provide supplemental cortisol at times of severe trauma, acute illness, or surgical procedures, even though replacement therapy is not necessary in the iterim.

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Minnesota State Board of Medical Examiners

The Physical Therapy Examining Council will hold its next regularly scheduled meeting at 4:00 p.m., on Tuesday, May 2, 1978 in Room 335 of the Department of Health Building.

The Minnesota State Board of Medical Examiners will hold its next regularly scheduled meeting in Room 105 of the Department of Health Building at 8:30 a.m. on Friday, May 19, 1978 and 8:30 a.m. on Saturday, May 20, 1978.

AN INVITATION is extended to you by the St. Louis County and Range Medical Societies to attend the 1978 MMA Annual Meeting in Duluth, May 10-11-12.

Refractory Hypertension

Treatment with Clonidine Hydrochloride

RICHARD M. SWEET, M.D.;* BYRON D. DANIELSON, M.D.;* and RONALD L. WATHEN, M.D., Ph.D.*

Adjunctive therapy with clonidine hydrochloride was used in ten patients with moderate to severe hypertension. Satisfactory improvement in blood pressure control was obtained, and a minimum of side effects was observed. Of note was that other anti-hypertensive drugs could be either tapered or discontinued. The drug was effective regardless of the level of PRA or the existence of renovascular hypertension. We suggest clonidine be considered for use in patients with moderate to severe hypertension who have responded poorly to large doses of other antihypertensive medications.

CLONIDINE HYDROCHLORIDE (Catapres®) is an imidazoline derivative proven to be effective in the treatment of mild to severe hypertension when used alone or in combination with a diuretic.[1–4,6,7,10]

In this report, we describe our experience with clonidine in patients with moderately severe hypertension in whom blood pressure had been difficult to control while on recommended doses of other drug regimens. Our results suggest clonidine provides valuable adjunctive therapy in the treatment of hypertension and frequently permits a reduction in dose or withdrawal of other antihypertensive medications.

Patients and Methods

Patients were selected from the population attending the hypertension clinic at Hennepin County Medical Center. Criteria for initiating clonidine therapy in these patients were as follows: (1) less than optimal control on other antihypertensive medications at high doses, and (2) side effects of these drugs when increased to high doses. Summaries of pertinent medical histories, renal function (as defined by serum creatinine) and various therapeutic regimens at the time of initiation of clonidine are presented in Tables 1 and 2.

As demonstrated in Table 1, four patients had minimal to moderate elevations in serum creatinine. Renal arteriography had been performed on four patients, three of whom had surgery for renovascular disease. Two patients had unilateral nephrectomies, and another patient had a saphenous vein by-pass graft. Three patients did not have demonstrable renovascular disease or other secondary causes of hypertension. Finally, three patients were felt to have essential hypertension complicated by reduced renal function secondary to arteriolar nephrosclerosis.

Provocative salt depletion studies were not done to uncover "true" low renin hypertension, as all patients were already on hypertensive medication including diuretics. However, relative to our laboratory standards for plasma renin activity (PRA) and salt excretion, two patients had low, three patients had normal and two patients had high PRA. Normal PRA, as determined by radioimmunoassay, is 0.3 - 2.7 ng/ml/hr while the patient is excreting greater than 120 milliequivalents per day. PRA was determined by a modification of the method of Boyd et al.[19]

Blood pressures, determined after at least three minutes of recumbency and again after three minutes of upright posture, were taken by the staff physicians or clinic nurses. The disappearance of Karotkoff sounds was used as the indication of diastolic pressures. Body weight was measured at each clinic visit. All data were analyzed with the t-test for paired data.

Patients were started on clonidine therapy only after careful explanation of the drug's mode of action and side effects. Patients were observed first at weekly and then at monthly intervals after initiation of clonidine therapy. Final results were taken at six to nine months since, by this time, blood pressure control appeared uniform. Patients were specifically warned of the potentially serious consequences of abrupt withdrawal

*Regional Kidney Disease Program and the Department of Medicine of the Hennepin County Medical Center, Minneapolis, Minnesota.

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TABLE 1

Summary of Medical Histories and Laboratory Data

Age	Race	Sex	Past Medical History	Target Organ Damage	Serum Creatinine Before Clonidine (mg/dl)	Serum Creatinine During Clonidine (mg/dl)	Peripheral Renin Activity (ng/ml/hr)
33	W	F	Previous surgery for renal artery stenosis secondary to fibromuscular hyperplasia.	Grade III retinopathy.	1.0	1.0	Lateralizing renins at the time of surgery. 0.33 post-op.
44	N	M	Hypertensive for several years. Malignant hypertension 1974.	Grade III retinopathy. EKG:LVH LV enlargement on chest x-ray.	3.5	2.4	0.4 on admission for malignant hypertension.
36	W	M	Hypertensive since 1957. Renal artery stenosis and right nephrectomy in 1963.	EKG: Non-specific S-T changes.	1.4	1.3	0.44
38	W	F	Hypertension since 1968. Questionable acute glomerulonephritis in 1968.	EKG: non-specific S-T changes.	1.4	1.1	0.56
56	N	M	Hypertension since 1968.	Grade I retinopathy.	1.1	1.0	Not done.
54	W	F	Subdural hematoma 1969. Adult onset diabetes mellitus.	Coronary artery disease.	0.9	0.9	Not done.
51	W	F	Left nephrectomy 1967 for renovascular hypertension. Angina pectoris since 1967.	Grade I funduscopic changes.	1.0	0.9	1.75
63	W	M	Renovascular disease with stenosis of artery supplying the upper pole of the right kidney.	Grade III retinopathy.	1.1	1.0	53.5
54	W	M	Unremarkable.	Grade I retinopathy.	1.0	1.0	Not done.
60	N	M	Hypertensive for 15 years. Malignant hypertension 2/74 with central retinal artery occlusion. Subsequently patient had a left carotid endarterectomy.	Grade III retinopathy LVH on chest x-ray. EKG: Non-specific S-T changes.	1.6	1.7	6.57

*LVH - Left ventricular hypertrophy
LV - Left ventricular

TABLE 2

Weight, Blood Pressure and Drug Therapy
Before and During Clonidine Therapy

Weight, Blood Pressure and Drug Therapy Before Clonidine Therapy					Weight, Blood Pressure and Drug Therapy During Clonidine Therapy					
Weight (Kg)	Previous Drugs* Total Daily Dosage		Blood Pressures† Standing (mm Hg)	Supine (mm Hg)	Weight (Kg)	Present Drugs* Total Daily Dosage		Blood Pressures† Standing (mm Hg)	Supine (mm Hg)	Change in Mean Blood Pressure Standing (mm Hg)	Supine (mm Hg)
73.6	P Hy H A	560 mgm 200 mgm 50 mgm 750 mgm	180/120 (140)	184/124 (144)	72.7	C Hy H P	.45 mgm 150 mgm 50 mgm 120 mgm	110/76 (87)	130/90 (113)	−53	−31
60.4	G Hy	15 mgm 100 mgm	150/90 (110)	160/100 (120)	58.6	C Hy H	.8 mgm 200 mgm 50 mgm	120/84 (96)	138/92 (107)	−14	−13
103.2	A H Hy P	1.0 gm 50 mgm 200 mgm 320 mgm	200/120 (146)	208/130 (156)	95.9	C Hy H P	.45 mgm 150 mgm 50 mgm 120 mgm	130/90 (113)	110/75 (87)	−33	−69
84.0	Hy P S Hctz	200 mgm 480 mgm 100 mgm 100 mgm	150/108 (122)	145/95 (111)	83.2	C Hy Hctz S	45 mgm 75 mgm 50 mgm 75 mgm	140/70 (93)	130/80 (96)	−29	−15
91.8	Hy A S P F	200 mgm 1.0 gm 100 mgm 160 mgm 40-80 mgm	175/115 (135)	170/110 (130)	92.3	C S L Hy	0.6 mgm 100 mgm 40 mgm 150 mgm	130/90 (113)	115/80 (92)	−32	−38
63.6	A Hctz S	2 grams 100 mgm 50 mgm	200/110 (140)	200/98 (132)	60.9	C S A Hctz	.4 mgm 50 mgm 2 grams 100 mgm	150/84 (105)	160/90 (113)	−37	−19
74.1	A Hctz	2 grams 50 mgm	140/110 (120)	140/100 (113)	72.0	C Hctz	0.3 mgm 50 mgm	130/80 (97)	138/82 (101)	−33	−12
50.4	Hy A Hctz P S	75 mgm 2 grams 50 mgm 40 mgm 200 mgm	160/80 (116)	190/90 (123)	48.6	C Hctz	0.7 mgm 100 mgm	124/70 (88)	148/70 (96)	−18	−27
86.6	P Hy A	320 mgm 200 mgm 2 grams	160/110 (127)	140/110 (120)	85.0	C P H	0.9 mgm 240 mgm 50 mgm	140/90 (116)	140/95 (110)	−20	−10
114.0	A P Hy Hctz S	2 grams 80 mgm 200 mgm 100 mgm 100 mgm	210/140 (163)	180/110 (133)	107.3	C Hctz S	0.8 mgm 100 mgm 100 mgm	110/70 (83)	120/90 (100)	−80	−40

*P -propranolol
T -triamterene
C -clonidine
F -furosemide
Hy -hydralazine
H -chlorthalidone
A -alpha methyldopa
S -spironalactone
Hctz -hydrochlorothiazine
G -guanethidine

†Mean blood pressure, in brackets, is estimated as 1/3 the pulse pressure plus the diastolic pressure.

of the drug.[8,9] All patient drug regimens are displayed in Table 2.

Results

The individual and average results for standing and supine blood pressures and body weights are presented in Tables 2 and 3, respectively. Although the reported data are those obtained 6 to 9 months following initiation of therapy with clonidine, several patients responded satisfactorily earlier in their course of therapy.

It is apparent from the individual data in Table 2 that decreases in supine and standing blood pressures occurred universally. The decreases in mean blood pressures ranged from −14 to −80 mm Hg standing and from −13 to −69 mm Hg supine. In no case did clinically significant orthostatic hypotension occur during therapy. Furthermore, serum creatinine remained constant or improved slightly during therapy (Table 1). Finally, with one exception (Table 2), body weight changed concordantly with blood pressure, with decreases ranging from 0 to −7.3 Kg. Examination of individual drug regimens provided in Table 2 reveal that a number of the patients tolerated reductions or discontinuance of some medications during therapy with clonidine.

Table 3 depicts the average results for body weight and upright and supine systolic, diastolic and mean blood pressures. On the average, it is apparent that all parameters decreased with moderate to marked statistical significance. Of particular note are the average decreases in supine and standing systolic pressures of 39 and 42 mmHg, respectively.

Comments

Clonidine has proved to be a useful antihypertensive medication in numerous clinical studies. In our study we directed ourselves to the relationship between PRA and the efficacy of clonidine. We have found that clonidine is effective antihypertensive therapy irrespective of PRA or the presence of renovascular disease. Our patients were on at least two, and generally three, antihypertensive medications prior to the initiation of clonidine with less than optimal control of their blood pressure. After clonidine therapy was initiated, several of the patients' other drugs were either discontinued or the dosage reduced while blood pressure control was markedly improved.

As suggested by investigations in animal studies, clonidine's mode of action appears to be central alpha adrenergic stimulation which results in inhibition of the activity of the vasomotor center.[13,15,17] This inhibition results in a decrease in sympathetic outflow from the brain which causes cardiac slowing and a decrease in peripheral vascular resistance.[12,14,16] Also, Lars has demonstrated in rabbits a relaxation of the aortic smooth muscle.[18] Baer felt that the drug's mode of action was mediated via suppression of PRA and aldosterone excretion in hypertensive patients.[11] While we did not follow PRA temporally in our patients, PRA prior to initiation of clonidine therapy would suggest that the level of PRA does not determine its antihypertensive effect. The lack of relationship between BP control and PRA has also been reported by other investigators.[1,12]

Clonidine appears to be a useful drug in the treatment of various degrees of hypertension of diverse etiologies. Its effectiveness appears to be potentiated with the concomitant use of a diuretic.[3,5]

As others have pointed out, the side effects of clonidine are minimal, usually consisting of dry mouth, constipation or dizziness.[2,37] These usually subside with time. We noted no serious side effects in our patients. Hypertensive crises have been reported in several patients upon abrupt withdrawal of clonidine after long term therapy.[8,9] For this reason, patient compliance is necessary.

TABLE 3

Changes in Body Weight (BW), Supine and Upright Mean Blood Pressure ($S\bar{B}P$ and $U\bar{B}P$), Systolic Blood Pressure ($S\bar{B}P$) and Diastolic Blood Pressure ($D\bar{B}P$) Before and During Clonidine Therapy*

	BW (Kg)	$\bar{B}P$ Supine (mm Hg)	$\bar{B}P$ Upright (mm Hg)	$S\bar{B}P$ Supine (mm Hg)	$S\bar{B}P$ Upright (mm Hg)	$D\bar{B}P$ Supine (mm Hg)	$D\bar{B}P$ Upright (mm Hg)
Before:	80.0 ± 6.2	128 ± 4.4	132 ± 5.1	172 ± 7.8	172 ± 7.7	107 ± 4.0	110 ± 5.2
During:	77.7 ± 5.5	101 ± 2.8	99 ± 3.8	133 ± 4.8	128 ± 4.1	86 ± 3.0	82 ± 3.1
	(P = .01)	(P = .001)	(P < .001)	(P < .01)	(P < .01)	(P < .01)	(P < .01)

*All data are expressed as mean ± standard error the mean.

Finally, we observed weight loss in several patients while on clonidine. The reason(s) for this are unclear and a similar observation has not been reported by other investigators. However, Humphreys et al.[20] has demonstrated a transient suppression of antiduretic hormone secretion following intravenous clonidine in dogs. This resulted in correspondingly transient increase in urine volume in the experimental animals. One might speculate that a more prolonged antidiuretic effect could have occurred in our patients, resulting in a loss of weight via diuresis. Other possible explanations include: (1) a better patient compliance in taking all drugs; (2) improved renal perfusion (with resultant diuresis) due to better cardiac performance following control of blood pressure; or (3) possible suppression of appetite in association with clonidine's other actions in the central nervous system.

Acknowledgments

The authors wish to thank Nancy Westburg Johnson for her help in preparing this manuscript and Beth Schwanebeck for her assistance with statistical analysis.

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Cover Photograph
"Sun-Moon Lake"

High in the central mountains of Taiwan (Formosa) is an exotic body of water known as "Sun-Moon Lake." It is beautifully shrouded by low hanging clouds which give the entire area a mystic quality. This cover photograph was taken at Sunset using Agfachrome-64 film with a 43-86mm. zoom lens on an F-2 Nikon 35mm. camera, hand held.

Dr. Vernon L. Lindberg is a local Minneapolis Ophthalmologist. He is a graduate of the University of Minnesota and presently a Clinical Associate Professor, Department of Ophthalmology University of Minnesota Medical School, Minneapolis.

His trip to Taipei in August 1977, was sponsored by the Chinese Rhenish Church of Hong Kong. Its purpose was to do a study on the feasibility of adding an Eye Department to the new PU-TSI MEDICAL CLINIC. This clinic is centrally located in the YUNG HO (Cantonese) section of Taipei (Pop. 2,000,000).

Fortunately, the Taiwan University Hospital with its 1000 bed capacity is only a short distance away. The Project has been approved by the Chinese Rhenish Church, and Dr. Lindberg will be returning to Taipei for an extended period later in 1978 to establish this new facility.

Minnesota Medical Association

Nominees for State Offices

In cooperation with the House of Delegates, we are publishing the list of nominees for Minnesota Medical Association offices. In addition, any delegate may make nominations from the House of Delegates floor after the report of the Nominating Committee.

Each elected official will assume his position at the conclusion of the 1978 Annual Meeting. The current president-elect, Robert S. Flom, M.D., was elected in 1977 and will become president after the 1978 Annual Meeting concludes.

President

Frank E. Johnson, MD

Dr. Johnson, a specialist in thoracic and cardiovascular surgery, practices with the Minnesota Thoracic Group, PA, Minneapolis.

Currently chairman of the Board of the Hennepin County Medical Society, Dr. Johnson has served two terms as president of the medical staff of Northwestern Hospital, Minneapolis, and as president of the Minneapolis Surgical Society and Hennepin County Medical Society. He is a member of the Board of Directors of the Metropolitan Medical Center Hospital and Hennepin County Physicians Health Plan. Additionally, he has served on the Board of Directors of the Foundation for Health Care Evaluation and been a member of numerous other medically oriented organizations including the American College of Cardiology, American Heart Association, and American Association for Thoracic Surgery.

First Vice President

John B. Coleman, MD

Dr. Coleman is a certified radiologist and a member of St. Paul Radiology, P.A.

An active member of the Minnesota Medical Association for many years, Dr. Coleman is credited with being the architect of the Physicians Health Force that was created by MMA to monitor and provide input to the newly created Health Service Agencies (HSAs). Dr. Coleman's idea has drawn national attention from the U.S. Dept. of Health, Education, and Welfare, and the AMA which published a major feature article describing the program in a December issue of AMA NEWS and several other states have adopted it.

In addition to service as chairman of the MMA Committee on Health Planning, Dr. Coleman recently became a consultant to the AMA in health planning. He recently concluded a year as president of the Minnesota Radiological Association.

Robert L. Sauer, MD

Dr. Sauer has been in general practice in Preston for ten years.

He has been a delegate to the Minnesota Medical Association for nine years and president of the Zumbro Valley Medical Society in 1976. Dr. Sauer is a member of the Association's Committee on Medical Aspects of Sports. In addition to the Association, Dr. Sauer is active in the American Academy of Family Physicians and the Minnesota Academy of Family Physicians.

Second Vice President

Theodore L. Johnson, MD

Dr. Johnson practices at the Duluth Clinic and is a member of the clinic's Board of Directors. An associate professor of medicine with the University of Minnesota at Duluth, School of Medicine, Dr. Johnson has served as chief of medicine at both Miller-Dwan and St. Mary's Hospitals in Duluth and chief of staff at Miller-Dwan.

An internist, Dr. Johnson has produced numerous professional papers and programs in the area of renal transplantation, digitalis toxicity, and other related studies.

Thomas G. Briggs, MD

Dr. Briggs is a board certified family practitioner and practices in White Bear Lake. He was chief of staff of St. John's Hospital in 1971 and 72 and currently is medical director of St. John's Hospital Chemical Dependency Unit. He has been a MMA delegate for six years and was vice chairman of the MMA Legislative Committee for three years. Currently, he is chairman of the Subcommittee on Alcoholism and Other Chemical Dependencies and a member of the Public Health Education Committee. He also heads up the MMA's Impaired Physicians Committee and is working with the AMA on the 1978 National Impaired Physicians Conference which will be held in Minneapolis next fall.

He was president of the Ramsey County Medical Society in 1976.

A clinical associate professor of family practice at the University of Minnesota, he is a member of the American Academy of Family Physicians.

Dr. Briggs has been on the board of directors of St. John's Hospital for five years, and a member of its Executive Committee for ten years.

Secretary

John M. Burns, MD

Dr. Burns is board certified in Internal Medicine and Nephrology and practices in St. Paul with three associates. He is on the staff of all St. Paul hospitals and was chief of staff at Samaritan Hospital in 1973.

He has been an MMA delegate for the past three years. Currently, he is chairman of the Hemodialysis Transplant Committee and also serves on the Committee on Aging. He is chairman of the Ramsey County Delegation to the MMA House of Delegates.

Dr. Burns is a member of the St. Paul Society of Internal Medicine. He is a clinical assistant professor of Internal Medicine at the University of Minnesota Medical School. He is a former president of the Kidney Foundation of the Upper Midwest and president of the Minnesota Physicians United for Human Life.

Treasurer

Paul S. Blake, MD

Dr. Blake, Minneapolis neurological surgeon, is a member of eight hospital staffs in the Twin Cities metropolitan area and is on the Board of Trustees at St. Mary's Hospital.

He is a clinical assistant professor of neurological surgery at the University of Minnesota. Presently he is the treasurer of the Minnesota Medical Association. He was on the Board of Directors of the Hennepin County Medical Society for 12 years and served as its president in 1971.

Dr. Blake has served as a delegate to the MMA for six years and is a member of the Committee on Permanent Evaluation and the Committee on Scholarships and Loans. He served on the Nominating Committee for three years and was a member of the Ad Hoc Committee of the council for the organization of the socio-economic division.

Treasurer *(continued)*

Harley J. Racer, MD

Dr. Racer has been a family physician practicing in Gibbon, Stillwater, and Bloomington from 1952 through 1969. In 1969, Dr. Racer joined the St. Louis Park Medical Center as the first physician in the Family Medicine Department. In 1971, he began to teach in the Family Practice Residency Unit at Methodist Hospital and the St. Louis Park Medical Center, as a part of the University of Minnesota Affiliated Hospitals Family Practice Residency Program. In July, 1977, the unit reorganized as the Methodist-University Family Practice Residency Unit, re-establishing its Family Practice Center in the Meadowbrook Medical Building attached to Methodist Hospital.

Dr. Racer is an associate professor in the Department of Family Practice and Community Health, a full-time faculty member, and is responsible for the direction of the 18 Family Practice residents who are in the program at Methodist Hospital in St. Louis Park.

Speaker of the House

Severin H. Koop, Jr., MD

Dr. Koop is vice speaker of the MMA House of Delegates. A board certified otolaryngologist, Dr. Koop is past president of the Minnesota Academy of Ophthalmology and Otolaryngology. He is also clinical assistant professor at the University of Minnesota Department of Otolaryngology.

With the MMA, Dr. Koop has been a member of the Committees on Conservation of Hearing and Medical School Relations, and was first vice president in 1973.

He lists membership in the Stearns-Benton County Medical Society, American Medical Association, and American Academy of Ophthalmology and Otolaryngology.

Vice Speaker

Lawrence Poston, MD

Dr. Poston has been in Family Practice in Caledonia for the past 13 years. He has been a member of both the Minnesota and American Academies of Family Physicians since beginning practice in 1964. He is a diplomate of the American Board of Family Practice.

He served as a delegate from Zumbro Valley to the MMA House of Delegates for ten years. He is a member of the Zumbro Valley Society Executive Committee and serves with the MMA Committee on Family Practice. He has served as chairman and member of several reference committees for the House of Delegates.

Dr. Poston has been a member of the board of directors for PSQCM (southern Minnesota PSRO) since its beginning and is presently vice president of the board.

He was a preceptor for the University of Minnesota Rural Physician Associate Program for three years.

AMA Delegates

Lloyd G. Bartholomew, MD

Dr. Bartholomew, head of the Section of Gastroenterology at Mayo Clinic, Rochester, has been a consulting physician at Mayo since 1952.

Past president and an MMA delegate from the Southern Minnesota Medical Association, Dr. Bartholomew has held most offices in the SMMA. He also has served on numerous AMA Committees and is an editorial consultant for JAMA and chairman of the AMA Council on Continuing Physician Education.

Dr. Bartholomew has chaired the MMA Scholarship and Loan Committee since 1967

AMA Delegates *(continued)*

Robert T. Kelly, MD

Dr. Kelly is one of an 11-member multi-specialty group in Grand Rapids where he has practiced since 1952.

An active member of the MMA, Dr. Kelly has served as delegate to the AMA since 1968. He is chairman of the Minnesota delegation to the AMA and serves as vice chairman of the AMA's Council on Medical Service. Further, he is a member of the National PSRO Advisory Council, and a member of the AMA Speakers' Bureau.

He served as president of MMA in 1971-72, and is president-elect of the North Central Medical Conference. Chairman of the committee which formed the Range Medical Society, he has served as secretary-treasurer and president of that society.

AMA Alternates

Arnold L. Brown, MD

Dr. Brown is chairman of the Department of Pathology and Anatomy, Mayo Clinic and Medical School. He joined the Mayo staff in 1959.

He served as a delegate to the MMA from Zumbro Valley Medical Society from 1969 to 1975 and is a member of the MMA Legislative Committee at present.

James W. Halvorson, MD

Current Speaker of the House of Delegates, Dr. Halvorson, was Association vice president, 1971-72, and vice speaker, 1974-75.

He is a member of the Committees on Automotive Injuries, Residents and Medical Students, and Mental Health and Subcommittee on Alcoholism and Other Chemical Dependencies. He is chairman of the Association-sponsored Discussion Group Concerned with the Alcohol-Impaired Driver and Highway Safety and on the Board of Editors of MINNESOTA MEDICINE.

In recognition of his work to combat alcoholism and for programs relating to the drinking driver, Dr. Halvorson was given the AAA Service to Monitoring Award in 1972. He is on the Board of the Minnesota Council on Alcohol Problems and serves on the Advisory Committee to the Hennepin County Alcohol Safety Action Project.

Preceptor in family practice for Mayo Medical School, Dr. Halvorson has been in family practice in Zumbrota for nearly 20 years and is a diplomate American Board of Family Physicians and a charter fellow, American Academy of Family Physicians. He is a member and past president of the Goodhue County Medical Society which he long has served as delegate to the House of Delegates.

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Each capsule contains 5 mg chlordiazepoxide HCl and 2.5 mg clidinium Br.

Please consult complete prescribing information, a summary of which follows:

Indications: Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

"Possibly" effective: as adjunctive therapy in the treatment of peptic ulcer and in the treatment of the irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis.

Final classification of the less-than-effective indications requires further investigation.

Contraindications: Glaucoma; prostatic hypertrophy, benign bladder neck obstruction; hypersensitivity to chlordiazepoxide HCl and/or clidinium Br.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants, and against hazardous occupations requiring complete mental alertness (*e.g.*, operating machinery, driving). Physical and psychological dependence rarely reported on recommended doses, but use caution in administering Librium® (chlordiazepoxide HCl) to known addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions) reported following discontinuation of the drug.

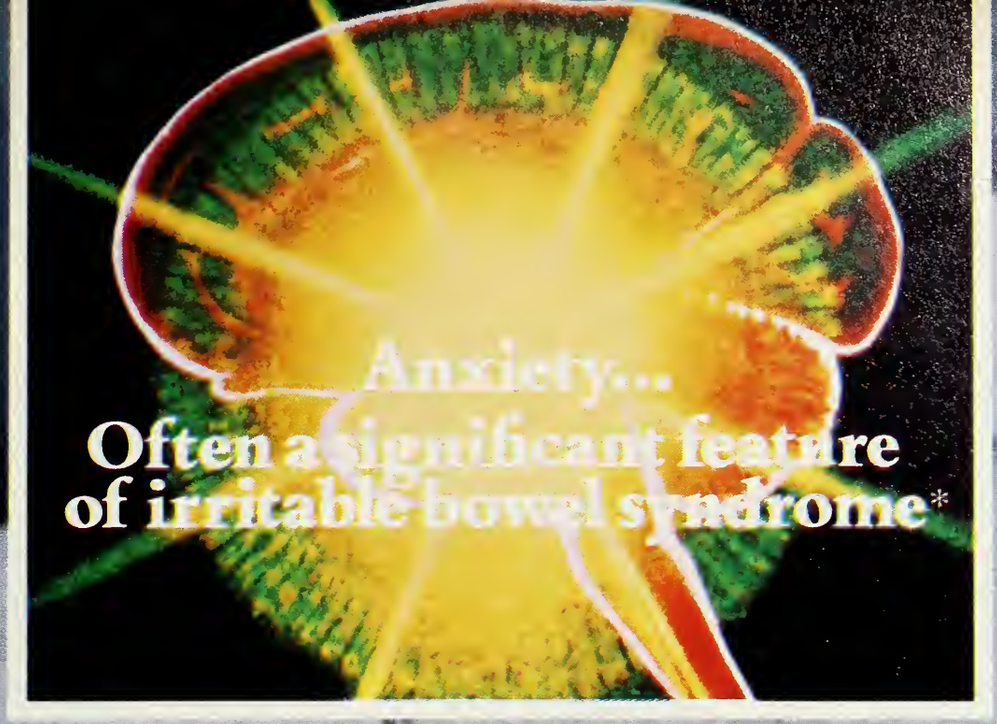
Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy. Advise patients to discuss therapy if they intend to or do become pregnant.**

As with all anticholinergics, inhibition of lactation may occur.

Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude ataxia, oversedation, confusion (no more than 2 capsules/day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider pharmacology of agents, particularly potentiating drugs such as MAO inhibitors, phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions reported in psychiatric patients. Employ usual precautions in treating anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship not established.

Adverse Reactions: No side effects or manifestations not seen with either compound alone reported with Librax. When chlordiazepoxide HCl is used alone, drowsiness, ataxia, confusion may occur, especially in elderly and debilitated; avoidable in most cases by proper dosage adjustment, but also occasionally observed at lower dosage ranges. Syncope reported in a few instances. Also encountered: isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent, generally controlled with dosage reduction; changes in EEG patterns may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice, hepatic dysfunction reported occasionally with chlordiazepoxide HCl, making periodic blood counts and liver function tests advisable during protracted therapy. Adverse effects reported with Librax typical of anticholinergic agents, *i.e.*, dryness of mouth, blurring of vision, urinary hesitancy, constipation. Constipation has occurred most often when Librax therapy is combined with other spasmolytics and/or low residue diets.

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Anxiety...
Often a significant feature
of irritable bowel syndrome*

The action of
Librium®
(chlordiazepoxide HCl)

A significant advantage
of adjunctive

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Each capsule contains
5 mg chlordiazepoxide HCl and
2.5 mg clidinium Br.

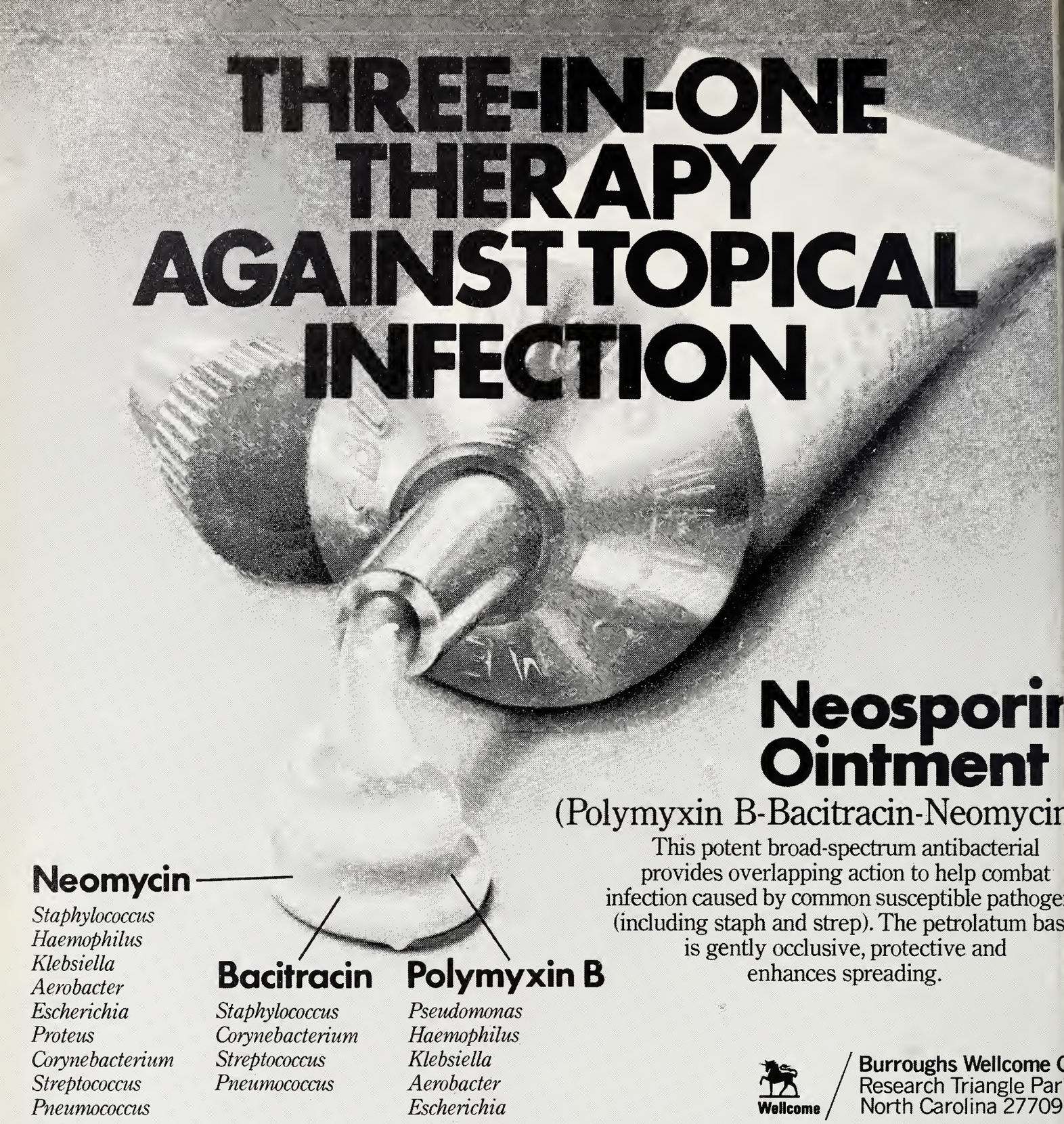
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Antisecretory
Antispasmodic

Librax is unique among G.I. medications in providing the specific antianxiety action of Librium® (chlordiazepoxide HCl) as well as the potent antisecretory and antispasmodic actions of Quarzan® (clidinium Br) for adjunctive therapy of irritable bowel syndrome* and duodenal ulcer.*

*Librax has been evaluated as possibly effective for this indication.
See brief summary of prescribing information on preceding page.

ROCHE

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Neosporin Ointment

(Polymyxin B-Bacitracin-Neomycin

This potent broad-spectrum antibacterial provides overlapping action to help combat infection caused by common susceptible pathoge (including staph and strep). The petrolatum bas is gently occlusive, protective and enhances spreading.

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Haemophilus
Klebsiella
Aerobacter
Escherichia
Proteus
Corynebacterium
Streptococcus
Pneumococcus

Bacitracin
Staphylococcus
Corynebacterium
Streptococcus
Pneumococcus

Polymyxin B
Pseudomonas
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Aerobacter
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In vitro overlapping antibacterial action of Neosporin® Ointment (polymyxin B-bacitracin-neomycin).

Wellcome

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Neosporin® Ointment

(Polymyxin B-Bacitracin-Neomycin)

Each gram contains: Aerosporin® brand Polymyxin B Sulfate 5,000 units; zinc bacitracin 400 units; neomycin sulfate 5 mg (equivalent to 3.5 mg neomycin base); special white petrolatum qs; in tubes of 1 oz and 1/2 oz and 1/32 oz (approx.) foil packets.

WARNING: Because of the potential hazard of nephrotoxicity and ototoxicity due to neomycin, care should be exercised when using this product in treating extensive burns, trophic ulceration and other extensive conditions where absorption of neomycin is possible. In burns where more than 20 percent of the body surface is affected, especially if the patient has impaired renal function or is receiving other aminoglycoside antibiotics concurrently, not more than one application a day is recommended.

When using neomycin-containing products to control secondary infection in the chronic dermatoses, it should be borne in mind that the skin is more liable to become sensitized to many substances, including neomycin. The manifestation of sensitization to neomycin is usually a low grade reddening with swelling, dry scaling and itching; it may be manifest simply as failure to heal. During long-term use of neomycin-containing products, periodic examination for such signs is advisable and the patient should be told to discontinue the product if they are observed. These symptoms regress quickly on withdrawing the medication. Neomycin-containing applications should be avoided for that patient thereafter.

PRECAUTIONS: As with other antibacterial preparations prolonged use may result in overgrowth of nonsusceptible organisms, including fungi. Appropriate measur should be taken if this occurs.

ADVERSE REACTIONS: Neomycin is a not uncommon cutaneous sensitizer. Articles in the current literature indicate an increase in the prevalence of persons allergic to neomycin. Ototoxicity and nephrotoxicity have been reported (see Warning section).

Complete literature available on request from Professional Services Dept. PML.

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DYAZIDE®

Each capsule contains 50 mg. of Dyrenium® (triamterene, SK&F Co.) and 25 mg. of hydrochlorothiazide.

MAKES SENSE



Before prescribing, see complete prescribing information in SK&F Co. literature or PDR. A brief summary follows:

Warning
This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

Indications: When the combination represents the dosage determined by titration: Adjunctive therapy in edema associated with congestive heart failure, hepatic cirrhosis, the nephrotic syndrome. Corticosteroid and estrogen-induced edema, idiopathic edema; hypertension, when the potassium sparing action of triamterene is warranted. (See Box Warning.) Routine use of diuretics in healthy pregnant women is inappropriate; they are indicated in pregnancy only when edema is due to pathological causes.

Contraindications: Further use in anuria, progressive renal or hepatic dysfunction, hyperkalemia. Pre-existing elevated serum potassium. Hypersensitivity to either component or other sulfonamide-derived drugs.

Warnings: Do not use potassium supplements, dietary or otherwise, unless hypokalemia develops or dietary intake of potassium is markedly impaired. If supplementary potassium is needed, potassium tablets should not be used. Hyperkalemia can occur, and has been associated with cardiac irregularities. It is more likely in the severely ill, with urine volume less than one liter/day, the elderly and diabetics with suspected or confirmed renal insufficiency. Periodically, serum K^+ levels should be determined. If hyperkalemia develops, substitute a thiazide alone, restrict K^+ intake. **Associated widened QRS complex or arrhythmia requires prompt additional therapy.** Thiazides cross the placental barrier and appear in cord blood. Use in pregnancy requires weighing anticipated benefits against possible hazards, including fetal or neonatal jaundice, thrombocytopenia, other adverse reactions seen in adults. Thiazides appear and triamterene may appear in breast milk. If their use is essential, the patient should stop nursing. Adequate information on use in children is not available.

Precautions: Do periodic serum electrolyte determinations (particularly important in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

Supplied: Bottles of 100 and 1000 capsules; Single Unit Packages of 100 (intended for institutional use only).

FOR LONG-TERM CONTROL OF HYPERTENSION.* SERUM K^+ AND BUN SHOULD BE CHECKED PERIODICALLY. (SEE WARNINGS SECTION.)

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Wanted Movies of Ceremony, But Both Factions Are

WASHINGTON, Aug. 26, 1920—



Social Security Bill Is Signed; Gives Pensions to Aged, Jo

Roosevelt Approves Message Intended to Benefit 30,0 Persons When States Adopt Cooperating Laws—H C the Measure 'Cornerstone' of His Economic Prog m

WASHINGTON, Aug. 4, The Social Security Bill, ro a broad program of unem l insurance and old age e and counted upon to be f 20,000,000 persons, becam l day when it was signed y dent Roosevelt in the pr se those chiefly responsible fo ting it through Congress.

Mr. Roosevelt called the "the cornerstone in a which is being built that mea s comple ri

SENATE APPROVES 18-YEAR OLD VOTE IN ALL ELECTIONS

Amendment to Constitution is Sent to House, Where Passage is Expected

WASHINGTON, March 10, 1971—The Senate approved today, 94 to 0, and sent to

TRUMAN CLOSES TED NATIONS CONFEREN ITH PLEA TO TRANSLATE CHARTER INTO DEEDS

NEW WORLD HOPE

President Hails 'Great Instrument of Peace,' Insists It Be Used

HISTORIC LANDMARK

Meeting Gives Standing Ovation as Executive Pictures Peace Gain

"If we fail to use it," he declared to the solemn final meeting of the delegates, 'we shall betray all of those who have died in order that we might meet here in freedom and safety to create it.'

"If we seek to use it selfishly—for the advantage of any one nation or any small group of nations—we shall be equally guilty of that betrayal."

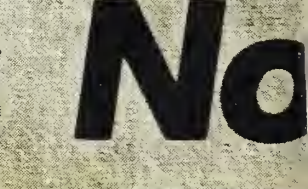
Fervent Interpolation

The President, speaking in the auditorium of the War Memorial Opera House, built in memory of sons of the Golden Gate city who gave their lives in the first World War, in which he himself served, seemed to give unconscious expression to the solemn feeling of the occasion when, at the outset of his speech, he interpolated the words, half a hope, half a prayer:

"Oh, what a great day this can be in history!"

Just before the plenary session the President accompanied the

SIGNED the Draft Ends No



WASHINGTON, Jan. 27, 1973—"With the signing of the peace agreement in Paris today, and after receiving a report from the Secretary of the Army that

PATIENT PACKAGE INSERTS: A CONCEPT WHOSE TIME HAS COME?

The consumer's right to know is an irreversible and desirable trend of the Seventies. It extends, and properly, to a patient's right to know more about his or her prescription medications. One way, gaining favor, is through patient package inserts. Wisely-prepared and properly distributed when medically indicated, they could markedly improve patient knowledge and drug therapy—laudable goals by anyone's standards.

The PMA endorses these goals and will work with government, the health professions and consumers to achieve them.

The Advantages

The concept holds promise of benefits: better patient understanding of the product prescribed, better adherence to the treatment plan, and more awareness of possible side reactions.

Every doctor has had patients who fail to finish antibiotic regimens because they feel better. Some patients assume that if one tranquilizer or analgesic is good, two may be twice as good. Still others fail to report dizziness while on antihypertensive therapy —and so on.

Problems like these might arise less often if the patient received written information in addition to verbal instructions. Some studies suggest that patients are more receptive to such materials, and they more often understand the verbal instructions and follow them, when inserts are used.

The Disadvantages

There are also some potential problems. Obviously, the inserts must be clearly phrased, without extraneous or complex detail. How much information is enough? How can it be kept current? Should all patients receive the same information? Should inserts be included with all drugs? Should only potential problems be listed or are patients better off with a "fair balance" presentation that describes usefulness as well as drawbacks?

These and similar questions require answers, since model inserts have yet to be properly developed and tested. Despite the need for these studies, the FDA is proceeding prematurely with inserts on selected products. We think the Congress is the only place where the matter can be given the proper legal status and direction, particularly since it represents a conceptual change in the legal, medical and social framework of the nation's prescription drug information system.

The Solution

The PMA believes that carefully-devised pilot studies of various kinds of inserts are needed. They should be developed and implemented with full participation by doctors, pharmacists, consumers, communications experts and the drug industry. Such studies will provide reliable pathways to follow, so that inserts will be useful aids to medical practice.

And particularly we think that you should be closely involved in this debate and in these studies and decisions. Otherwise, people with less experience and qualifications may control the purposes, content and use of a tool with considerable promise for improved patient care. It could make a difference in your practice tomorrow, and more importantly, in the health of your patients.

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Sims explains traditional clothing in terms any doctor can understand.



Shirt: Cotton oxford cloth, button down collar with a slight roll at the neck.

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Lapel: Narrower, notched and gently rolling.

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Shoes: Thick leather soles with reverse welting. Leather lined, orthopedically correct; in a variety of styles such as oxford, wingtip or blucher.

Natural shoulders: Soft, roomy and natural looking. Comfortable and becoming to men of all builds.

Armhole: Larger, unrestrictive, allowing for freer arm movement.

Construction: Fewer inner linings, less excess padding allow garment to weigh less and give and take with natural body movement.

Trousers: Straight leg, or slightly tapered.

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Editorials

Syndactylism

THE AUTHORS* have presented a difficult statistical long-term follow-up review of syndactyly of the hand which is the most common significant congenital hand anomaly. This long-term evaluation was difficult, because of the many different surgeons who did the surgery and the different operative techniques over the period of 24 years.

The principle in the surgical treatment of a syndactylism is to create a commissure between the involved fingers that is cosmetically acceptable and supple. Also, the opposing sides of the fingers involved should have coverage with skin that is supple and does not lead to a flexion contracture or limit the motion of the involved fingers. The authors have established a technique for surgical treatment that accomplishes this.

The authors conclusion that surgical results are better when children are operated on at approximately age 18 months correlates with most other studies and establishes approximately the age at which surgery should be contemplated. They also point out that diligent postoperative follow-up of patients should be done. This should also include the teenage growth spurt years so as to be aware of any secondary deformities that may occur.

It is appropriate that mention should be made of the necessity of separating the border digits, the little finger and the thumb earlier than the index, long and ring fingers. This is necessary, because of the deformity that can occur at the border fingers as a result of the considerable difference in length which exists with the adjacent finger.

Most syndactylism involves the long and ring fingers and when utilizing local flaps to cover the defect, preference should be given to using these flaps to cover the ring finger which is the finger that bears the wedding band in later years.

Elmer R. Salovich, M.D.
Minneapolis, Minnesota

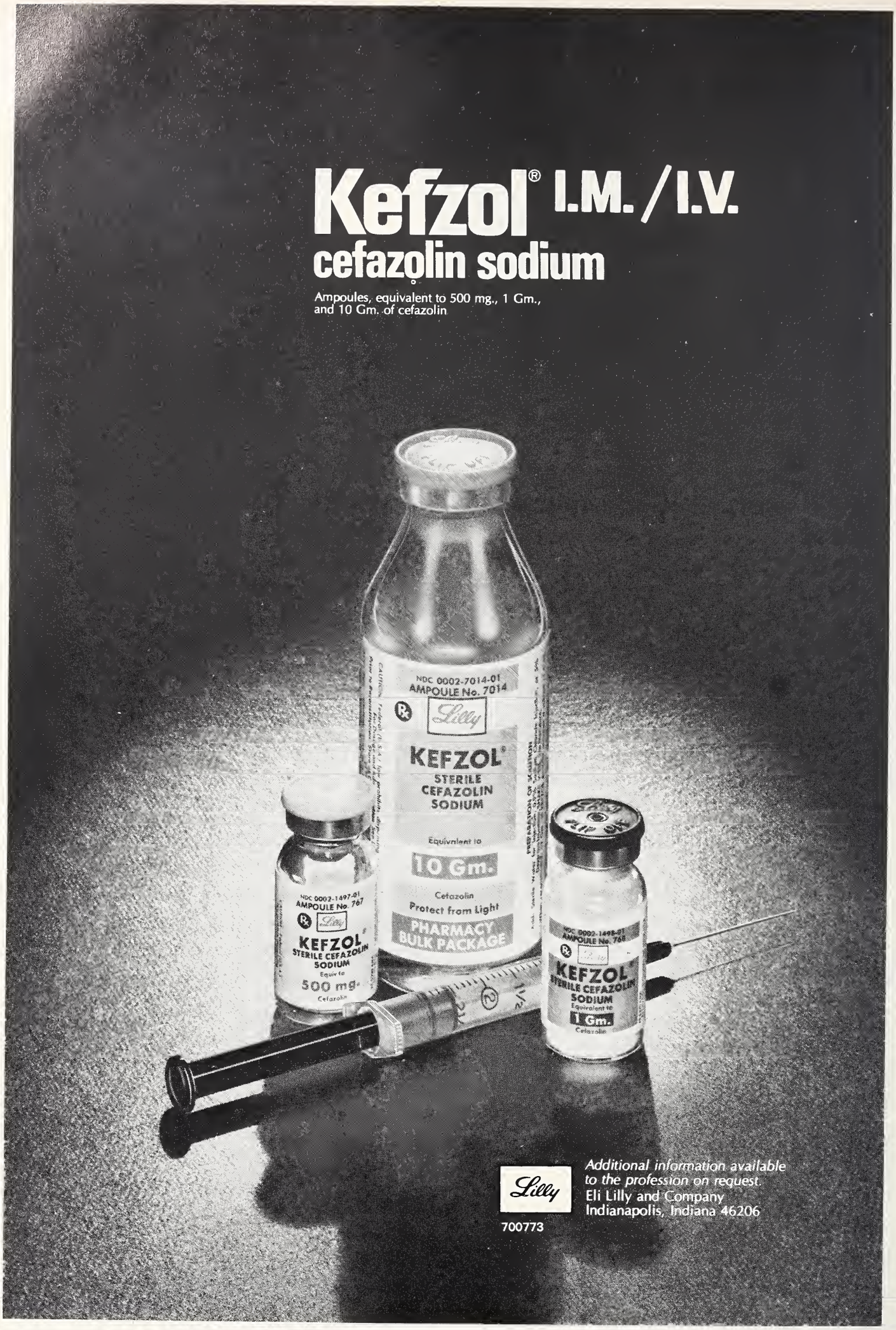
*Wyard, G.E. et al.: Syndactylism. Minnesota Med 61:3:177, 1978.

Duluth Annual Meeting

ANNUAL MEETING RECEPTION: Wednesday May 10, 1978, Duluth Arena, 7-9 pm. Exhibits will be open, complimentary hors d'oeuvres and cash bar available. Plan to arrive in time to attend this new event.

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Ampoules, equivalent to 500 mg., 1 Gm.,
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Rheumatic Fever in Minnesota

THE AUTHORS, Dahl et al., see page 249, have stressed several points that have been of concern to workers in the field and particularly to pediatric cardiologists for sometime.

Over diagnosis leads to a prolonged period of commitment to antibiotic prophylaxis, and a labeling that haunts the patient in years to come with respect to insurability and job promotion. The authors have emphasized the need of specific adherence to major and minor criteria for diagnosis whenever possible. This, hopefully could result in less over diagnosis.

It is currently recognized that there is a diminishing frequency and severity of rheumatic fever particularly in North America and Europe.[1,2] Despite this knowledge, difficulty in identification of *incidences* (that is, the number of new cases in the population observed during a specific period of time), and prevalence (the number of patients with rheumatic fever in a given population at one point in time) persists. Incidence is the observed frequency of first attacks or recurrences, and prevalence is usually described as the rate of rheumatic heart disease in the community. Thus mild cases may lead to a low incidence number but a high prevalence.

It is clear from the recommendation of the Committee on Prevention of Rheumatic Fever and Bacterial Endocarditis of the American Heart Association[3] as well as that reported by others earlier[4,5] that there is less effectiveness of the oral as against the intramuscular prophylaxis. Persons experiencing recurrent acute rheumatic fever episodes have a higher frequency of heart disease.

Drs. Wannamaker and Kaplan have stated: "Though less common now than previously, at least in its recurrent and most crippling form, acute rheumatic fever maintains its position as the leading cause of post-natally acquired heart disease in children in the United States and Western Europe."[6] Stollerman has also emphasized this point.[7]

The authors are to be commended for their review of this data and for their strong encouragement of us as physicians to re-educate ourselves in this most fascinating and complex disease with serious long range implications.

Harold Katkov, M.D.
Minneapolis, Minnesota

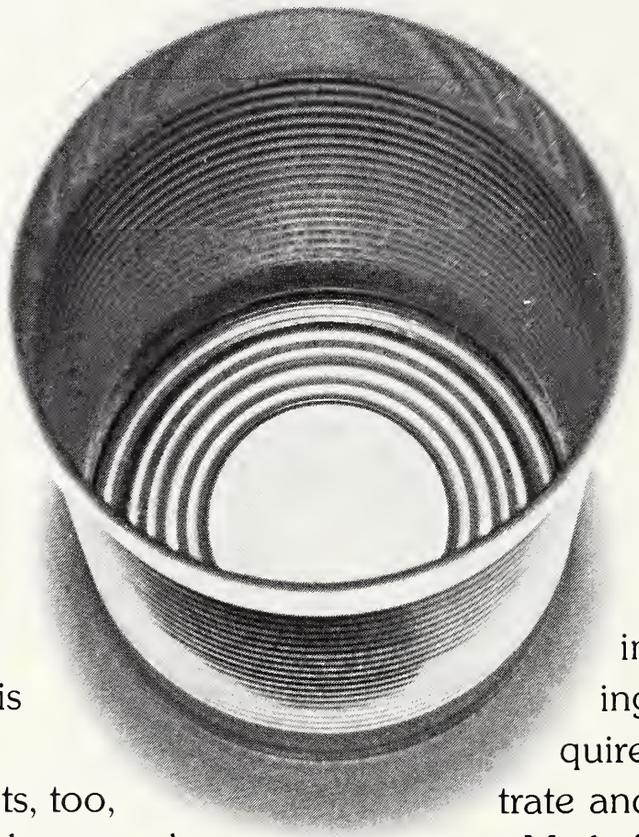
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6. Wannamaker LW, Kaplan EL: Acute rheumatic fever, pp. 515-532, in Heart Disease in Infants, Children, and Adolescents, Moss et al., The Williams & Wilkins Company (2nd ED.), 1977.
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University of Minnesota Medical Alumni Association

The Medical Alumni Association of the University of Minnesota will sponsor the Annual Medical Class Reunion on June 17, 1978. Plans include a one-day, continuing medical education seminar on campus. Diehl awards will be presented to Herman E. Drill, M.D. and Lester H. Bendix, M.D.

NOW a two-piece 14oz. can for Soyalac



A two-piece can means no soldered seam. No solder means no possibility of lead contamination from the container. Soyalac is the first infant formula with this packaging innovation.

There are improvements, too, in the formulation. Soyalac now has 25% more iron than known competitive hypoallergenic milk-free formulae. In fact, the entire formula has been slightly modified to reflect the current U.S. RDA levels set by the Food and Drug Administration.

Soyalac—formula for infants on regular feeding and for those who require milk-free diets; concentrate and single strength, ready-to-use. Made from the whole soybean. I-Soyalac concentrate, made from soy isolate, with no soy carbohydrates and **no corn products.**



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*Posthumous.

Laboratory Letter

Metabolic Screening — The New Look

CHARLES W. JARVIS, M.D.*

Cretinism is not a relic of a distant, medically unenlightened past which disappeared when our parents started using iodized salt. Cretins account for 1-2% of admissions to institutions for the mentally retarded. It is generally agreed among pediatricians that 75% of all hypothyroid infants can be salvaged if therapy is started by three months of age. While it is true that there is limited placental transport of thyrotropin (TSH) and the thyroid hormones triiodothyronine (T_3) and thyroxine (T_4), there is some positive evidence that the 75% salvage rate can be improved by earlier diagnosis. The development of reliable radioimmunoassay tests to measure T_4 and TSH on capillary blood has made it possible to offer earlier diagnosis.

Many physicians are testing their newborn patients for T_4 sometime between birth and 6 weeks of age. The Minnesota Department of Health is in the process of setting up a pilot project to test all newborn babies for T_4 using the same sample of blood that is presently used for PKU testing. The early testing of all babies for hypothyroidism is to be encouraged, and there are compelling reasons of quality control and cost which make it attractive to have the testing done in a single laboratory. However, T_4 testing is not hypothyroid screening.

The Committee on Genetics of the American Academy of Pediatrics has addressed the issue of screening for congenital deficiency of thyroid hormone.[1]

The reader is also referred to a similar statement by the American Thyroid Association.[2]

A large number of infants have already been screened for T_4 deficiency in programs carried out in Quebec, New England, Oregon, Pittsburgh, and Toronto. Analyzing this experience, the Committee on Genetics states that a T_4 screening program should have four basic objectives: (1) testing, (2) patient retrieval, (3) diagnosis, and (4) follow up with counseling and treatment. The Committee urges that T_4 screening be done on a regional basis, that it involve all physicians interested in the care of newborn infants, that the quality of testing be continually monitored, and that the testing be completed and reported early enough that therapy can be started before the infant is one month old.

The Minnesota Department of Health is deep into planning a T_4 screening program. They seem to be aware of many of the problems in the PKU and galactosemia testing programs that they have started in the past. They have asked a number of pediatricians, endocrinologists and geneticists at the University of Minnesota to serve on an advisory committee. They are in the process of approaching the Minnesota Medical Association, the Minnesota chapters of the American Academy of Pediatrics, and the American Academy of Obstetricians and Gynecologists, the Minnesota Academy of Family Physicians, the Minnesota Society of Clinical Pathologists, and organized groups representing nurses, hospitals, and retarded citizens. They are asking these groups for suggestions, ideas, and help.

No physician will dispute the necessity for diagnosing hypothyroidism as early in life as possible. Here is a chance for every physician who is interested in the care of children to have a say in setting up a program designed to help the patient, not the programmer and that will really do what it is designed to do — help prevent the sequelae of congenital hypothyroidism.

*Children's Hospital, St. Paul, Minnesota.

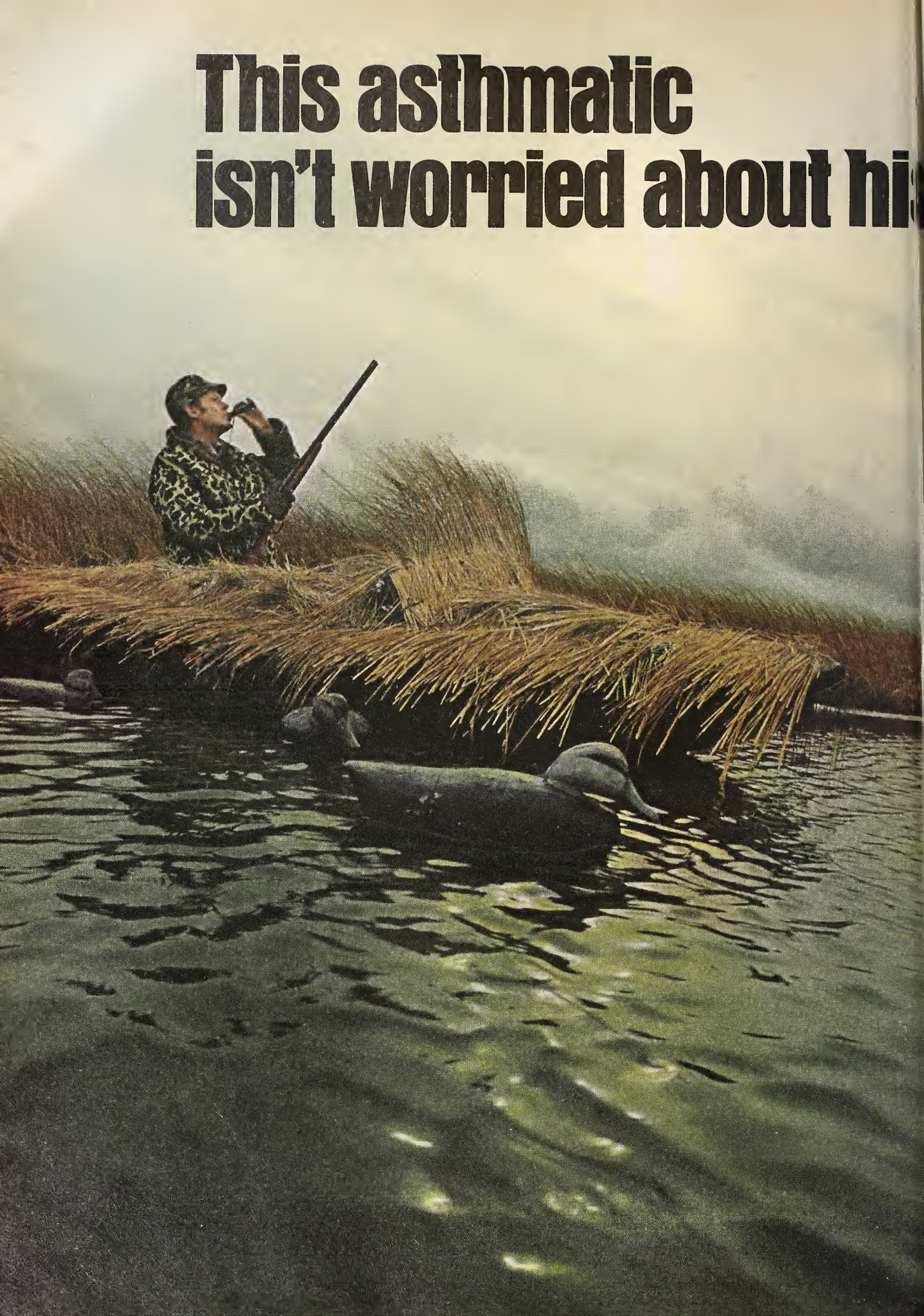
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Reference 1. Data on file, Mead Johnson Pharmaceutical Division.

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Adverse Reactions: Theophylline may exert some stimulating effect on the central nervous system. Its administration may cause local irritation of the gastric mucosa, with possible gastric discomfort, nausea, and vomiting. The frequency of adverse reactions is related to the serum theophylline level and is not usually a problem at serum theophylline levels below 20 μg/ml.

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History

The Gin Plague

ROY J. THURN, M.D.*

The occurrence of the gin plague from 1720 to 1750 in London and other cities of England is an example of unprecedented mass alcoholism. It gave rise to increased crime and mortality and decreased birth rate. Its evil was brought to the attention of the public and Parliament by a writer, Henry Fielding; and an artist, William Hogarth. The plague was controlled by taxes. A description is given and some thoughts are expressed.

JUST BEFORE THE MIDDLE of the eighteenth century, there occurred in London, England, a little known but fascinating significant event. The course of this was from 1720 to 1750. So profound were the effects of this period that Parliament feared for the English people and indeed for the Empire itself. The birth rate and death rate in London were markedly affected in an adverse manner. Interestingly enough, the great actors on the stage who brought attention and remedy to the problem were two men of exceptional artistic temperament. Henry Fielding in his role as writer and London magistrate, and William Hogarth, the artist, played great roles in bringing an unprecedented social problem under control. The event of which this writing concerns itself is the "gin plague." Immediately when one considers sociologic phenomena in the relatively recent history of England, one thinks of Charles Dickens and the Industrial Revolution. The "gin plague," however, preceded the Industrial Revolution and moreover occurred during the "Age of Reason"! This article will present a review of this extraordinary period in human events.

New Trade

Distilling was a new trade to England in 1720, and the corn crops generally were good, in fact so good that there were many times an excess of corn. If the crop was also good on the continent the price of corn plummeted. In that distilling absorbed this excess and stabilized the grain commodity price, Parliament set about to promote the distilling and consumption of spirits by throwing the distilling trade absolutely open.[1] Previous laws were overridden and new laws were made. Laws were passed encouraging distillers by the lowering or abolition of excise duties, and exempting distillers from the onerous burden of quartering soldiers. This resulted in a proliferation of distillers and a still greater increase in the numbers of retail outlets for gin. Retailers set up stills on their premises. The greatest offenders in the sale of gin were the chandlers, the equivalent of our modern grocery stores. In addition to this, it was sold by employers to their employees, and sold in the streets on barrel tops and wheelbarrows! To compound matters, gin was cheap. One of the mottos of the time was "Drunk for a penny, dead drunk for twopence, and free straw to lie on."

Excessive Consumption

The proliferation of distillers and retailers came upon a population which was ignorant and brutalized. The chief pleasures of the poorer classes in London were watching the hangings at Tyburn on Mondays, viewing the horrors of Bedlam, and crime.[2] Crime was such in London after the advent of the gin plague that one was extremely fearful of going out at night. The availability of a cheap and potent intoxicant exploded upon this population. Drunkenness became rife. In some sections of the city, every fifth house purveyed gin. Henry Fielding wrote concerning the gin drinking: "This odious vice and production of countless mischiefs including robbery and murder should be combated. Particularly was this the case with a new kind of drunkenness, unknown to our ancestors which had recently become prevalent and which if not checked would infallibly destroy a greater part of the inferior people. The drunkenness which I here intend is that acquired by the strongest intoxicating liquors and particularly by that poison called gin: which I have great reason to think is the principal sustenance of more

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than one hundred thousand people in this metropolis. Many of these wretches swallow pints of this poison within the twenty-four hours; the dreadful effects of which I have the misfortune everyday to see. The excessive consumption of this diabolical liquor was undermining the health, the strength, and the very numbers of his Majesty's most useful subjects. Nor was the injury confined to the existing generation; it is extended to posterity. What is to become of the infant who is conceived in gin? Are these wretched infants (if such can be supposed capable of arriving at the age of maturity) to become our future sailors and our future grenadiers?''[3]

The gin plague became progressively worse from 1720 to 1750. One can infer the magnitude of the problem by considering that in 1757 after the great orgy was over, Burrington, a contemporary, wrote, ''We do not see the hundredth part of poor wretches drunken in the streets.''[4] During this time a writer in the *Gentleman's Magazine* said, ''One-half of the town seems set up to furnish poison to the other half.'' The results were appalling, with men, women, and even children, drunkenness became a habit. Day and night, the shops which dealt in gin were crowded with ragged customers in various stages of intoxication. The anonymous author of a pamphlet entitled *Distilled Liquors the Bane of the Nation* (London 1736) stated that ''in one place, not far from East Smithfield, a trader has a large empty room backwards, where as his guests got intoxicated, they were laid together in groups promiscuously, men, women, and children, till they recovered their senses, when they proceeded to drink on, or having spent all they had, go out to find the wherewithal to return to the same dreadful pursuit.'' Crimes and prostitution increased. Abandonment of newborns on doorsteps, already a problem, became much worse and led to the establishment of a Foundling Hospital. The Bills of Mortality which were largely a compilation of baptisms and burials disclosed a terrible increase in deaths, a decrease in births, and a shocking infant mortality. This method of reporting was not nearly as refined as our present vital statistics but the overall accuracy was attested by no less a figure than William Heberden. He wrote in the middle of the century, ''There was one fact, which stood out in terrible clearness, that the deaths in London greatly exceeded the births, and this excess represented a drain on the nation.''[5] The waste of life was at its worst between 1720 and 1750. After 1760, it became clear that the burials were decreasing. During the years from 1730 to 1749 the burials of children were 74.5 percent! Children in workhouses (poorhouses) or put out to nurse by the parish died in still greater numbers. The mortality of these infants was 80 or 90% and of those received under twelve months 99%! It was said at the time by a committee from the Middlesex Sessions that ''unhappy mothers habituate themselves to these distilled liquors, whose children are born weak and sickly, and often look shriveled and old.'' Prematurity was a problem.

Henry Fielding

Toward the end of this remarkable plague Henry Fielding, the writer, entered the stage as a police magistrate. The magistrate had just replaced the ''trading justice.'' There was still corruption in the office until Fielding's appointment to Bow Street as chief magistrate for Westminster. He brought public spirit and honesty to the office and his effect was twofold. He, by his literary adeptness, was able to present to Parliament and his contemporaries a vivid picture of the situation existing. His honesty also brought effectiveness to the magistrate's office and he indeed brought a reorganization to London's police system. His satiric writings on ineffective laws enabled passing of effective laws. The first effective law was passed while he was in office. A contemporary and friend of Henry Fielding's was William Hogarth, the engraver and painter. He became interested in depicting social problems at about the time of Fielding's magistracy. Toward the end of the gin plague Hogarth made a popular engraving from his sketch called ''Gin Lane.'' This was a depiction of the frightful times; a mother drunk with gin allowing her baby to fall from a stone stairway, a dead addict is shown being placed in a wooden box, another drunken individual is shown in a wheelbarrow having gin poured down his throat. A pawn shop is doing a lively business in supplying people with money to buy more gin.[6] The rest of the picture is general chaos. It should be borne in mind that graphic prints at that time were a much more important means of communication than they are in our time. They were popularly sold and reached an important audience. It is noteworthy that Gin Lane was published in 1751, the same year that really effective legislation was passed. It is of more than passing interest that in all probability the two most effective people in bringing the gin plague to a close were artists, one a writer, the other an engraver and painter. Indeed the writing of this article was occasioned by the author viewing a reproduction of Hogarth's *Gin Lane* engraving and becoming curious as to its reason.[7]

Resolution of Plague

The resolution of the gin plague was effected almost entirely by increasing the price of gin by means of taxes, to put it out of range of easy accessibility, and the imposition of effective measures of tax collection. An act of 1736 which was in essence a prohibition, was followed by riots and in effect was defeated by the mob of people. The Act of 1743 was aimed at suppressing gin shops but was set back in 1747 by the distillers appealing to Parliament, and allowed to retail. In 1751 an effective act was passed following Fielding's writings and Hogarth's "Gin Lane," and the evidence of the Bills of Mortality. This act increased the excise tax, and limited the general sale by chandlers and other sundry shops. Coupled with this was an effective law enforcement largely due to Fielding the Magistrate. The decrease in the consumption of gin, and the betterment of the people was immediately discernable. The mortality rate went down and the birth rate went up. It is of interest to note that the association of alcoholism with cirrhosis of the liver was noted by Matthew Baille in 1793, and later by Addison.[8] (However, it was noted also by Vesalius in the seventeenth century.)[9] Recognizing that cirrhosis takes fifteen to twenty years to develop, a correlation between the gin plague and this finding might be made.

Conclusions

It is not the purpose of this article to make conclusions, but to present an interesting facet of history, the significance of which is enhanced by our present extensive problem with alcoholism. There are a few thoughts and questions engendered, however. One thought is that the gin plague was ameliorated by making gin too expensive for widespread consumption by means of taxes. Taxes are generally regarded as odious, but what would happen in our society if liquor was cheap? The federal tax on a gallon of distilled spirits is $2.10, in Minnesota the state tax is $4.39 a gallon. This accounts for about one-third of the price. It might be asked, should the taxes be higher still? Another aspect to consider is that the gin plague is an example of a societal disease that came upon a susceptible population. Did the availability of street drugs come upon a susceptible young population in the sixties in the same way? Finally, did the gin plague in England in the mid-seventeenth century affect the outcome of the American Revolution? The generation of English soldiers for that war had its origin during the period of the gin plague.

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See the package literature for dosage recommendations.

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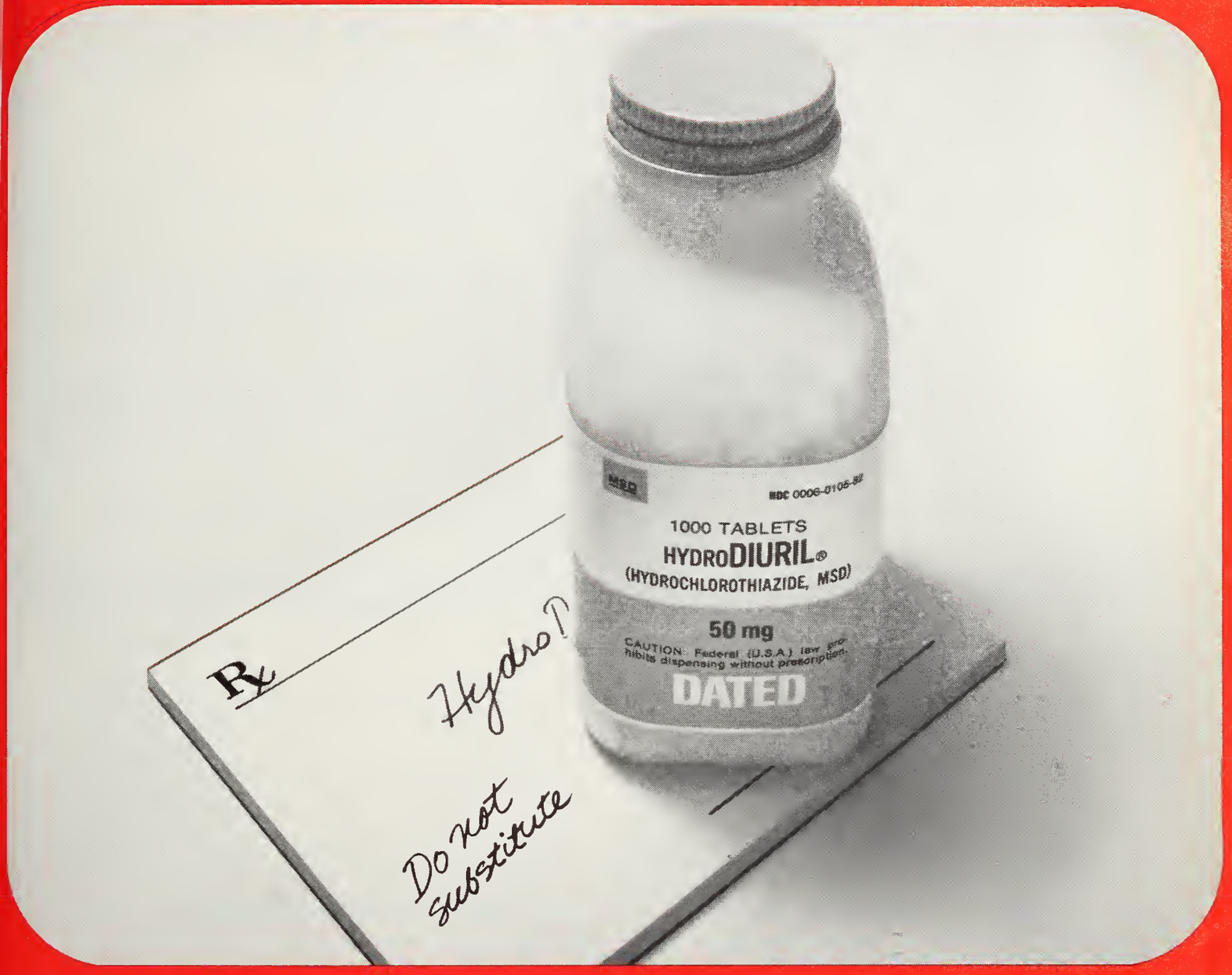
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Use in Pregnancy: Thiazides cross placental barrier and appear in cord blood; in pregnancy, weigh anticipated benefit against possible hazards to fetus, including fetal or neonatal jaundice, thrombocytopenia, and possibly other adverse reactions that have occurred in adults.
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Precautions: Perform periodic determination of serum electrolytes to detect possible electrolyte imbalance. Observe all patients for clinical signs of fluid or electrolyte imbalance, namely, hyponatremia, hypochloremic alkalosis, and hypokalemia. Serum and urine electrolyte determinations are particularly important when patient is vomiting excessively or receiving parenteral fluids. Medication such as digitalis may also influence serum electrolytes. Warning signs, irrespective of cause, are dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia, and gastrointestinal disturbances such as nausea and vomiting. Hypokalemia may develop, especially with brisk diuresis, in severe cirrhosis, with concomitant corticosteroid or ACTH therapy, or with inadequate oral electrolyte intake. Hypokalemia can sensitize or exaggerate response of heart to toxic effects of digitalis (e.g., increased ventricular irritability). Hypokalemia may be avoided or treated by use of potassium supplements, such as foods with a high potassium content. Any chloride deficit is generally mild and usually does not require specific treatment except under extraordinary circumstances (as in liver disease or renal disease). Dilutional hyponatremia may occur in edematous patients in hot weather; appropriate therapy is water restriction, rather than administration of salt except in rare instances when the hyponatremia is life threatening. In actual salt depletion, appropriate replacement is the therapy of choice.
Hyperuricemia may occur or frank gout may be precipitated in certain patients. Insulin requirements in diabetic patients may be increased, decreased, or unchanged; latent diabetes mellitus may become manifest. Thiazides may increase responsiveness to tubocurarine. Antihypertensive effects of the drug may be enhanced in post-sympathectomy patients. May decrease arterial responsiveness to norepinephrine; this diminution is not sufficient to preclude effectiveness of the pressor agent for therapeutic use. If progressive renal im-

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pairment becomes evident, consider withholding or discontinuing diuretic therapy. Thiazides may decrease serum PBI levels without signs of thyroid disturbance. Calcium excretion is decreased by thiazides. Pathologic changes in the parathyroid gland with hypercalcemia and hypophosphatemia have been observed in a few patients on prolonged therapy; thiazides should be discontinued before testing for parathyroid function.

Adverse Reactions: *Gastrointestinal System*—Anorexia; gastric irritation; nausea; vomiting; cramping; diarrhea; constipation; jaundice (intrahepatic cholestatic jaundice); pancreatitis; sialadenitis.
Central Nervous System—Dizziness; vertigo; paresthesias; headache; xanthopsia.
Hematologic—Leukopenia; agranulocytosis; thrombocytopenia; aplastic anemia.
Cardiovascular—Orthostatic hypotension (may be aggravated by alcohol, barbiturates, or narcotics).
Hypersensitivity—Purpura; photosensitivity; rash; urticaria; necrotizing angiitis (vasculitis) (cutaneous vasculitis); fever; respiratory distress including pneumonitis; anaphylactic reactions.
Other—Hyperglycemia; glycosuria; hyperuricemia; muscle spasm; weakness; restlessness; transient blurred vision.
Whenever adverse reactions are moderate or severe, thiazide dosage should be reduced or therapy withdrawn.

Note: When used with other antihypertensive drugs, careful observations for changes in blood pressure must be made, especially during initial therapy. Dosage of other antihypertensive agents must be reduced by at least 50 percent as soon as this drug is added to the regimen. As blood pressure falls under the potentiating effect of this agent, further reduction in dosage, or even discontinuation, of other antihypertensive drugs may be necessary.

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Special Article

Rheumatic Fever in Minnesota.

Current Assessment of Reported Cases

DIANE DAHL, M.D.;* F. BLANTON BESSINGER, JR., M.D.;* and EDWARD L. KAPLAN, M.D.*

We studied the records of sixty patients less than 20 years of age who were felt by their private physicians to have had acute rheumatic fever and who were reported to the Rheumatic Fever Registry of the Minnesota Health Department within four months of onset. Upon careful retrospective review, approximately 40% were thought not to fulfill the Jones' Criteria, suggesting over-reporting of acute rheumatic fever in Minnesota. Comparing the county of residency of these patients with population density data suggested that under-reporting of rheumatic fever also occurs in this state.

These data imply that the true incidence of rheumatic fever in Minnesota is unknown, a conclusion which demonstrates a need for re-evaluation of current methods of assessing rheumatic fever epidemiology in Minnesota.

SINCE 1960 THE MINNESOTA Department of Health, in cooperation with the Minnesota Affiliate of the American Heart Association (formerly called the Minnesota Heart Association), the Minnesota Medical Association and the Minnesota Pharmaceutical Association, has maintained a registry of patients with initial and recurrent attacks of rheumatic fever and those with rheumatic heart disease as part of a program for prevention of this non-suppurative sequel of streptococcal upper respiratory tract infection.[1] Previous studies of the numbers of patients reported and the diagnostic accuracy of Minnesota physicians reporting these cases have been published.[2,3] Evaluation suggested that a significant percentage of the reported cases did not satisfy the revised Jones' Criteria.[2,4] These studies also indicated that some physicians did not report suspected cases of rheumatic fever to the Minnesota State Health Department, (currently physicians are required to do so by health department regulations[5]), making the registry an inaccurate reflection of the number of cases occurring in the state.

A current review of a selected sample of cases of rheumatic fever reported to the registry was undertaken to attempt to indirectly evaluate the current incidence of this disease in Minnesota and to determine the proportion of cases reported to the Minnesota State Health Department registry which represent bona fide occurrences of rheumatic fever.

Such an assessment is important for several reasons. In an effort to assist in the planning and administration of primary and secondary rheumatic fever prevention programs an essential initial step is determining the true incidence and geographic distribution of the disease in this state. Because Minnesota currently has no state-wide detection or primary prevention program (i.e., treatment of streptococcal respiratory tract infections to prevent an initial attack of rheumatic fever), there has been an accelerating interest in initiating primary prevention programs such as the establishment of laboratory facilities, either in the Minnesota State Health Department or in other qualified laboratories, capable of handling large numbers of throat cultures. Others have suggested programs for streptococcal surveillance (by throat culture) in schools, even though the potential benefits of school surveillance programs for streptococci have been the subject of considerable debate. Secondly, an attempt has been made to examine the clinical features of acute rheumatic fever occurring in the 1970s and to compare them with previous studies carried out in Minnesota. Finally, it was hoped that the results of this study would prove to be useful in planning future professional education programs in Minnesota.

Materials and Methods

The records of all patients (20 years of age or younger) diagnosed by their physicians as having acute

*Department of Pediatrics, University of Minnesota Medical School, Minneapolis, Minnesota. Supported in part by a grant from the Minnesota Affiliate of the American Heart Association and by the Dwan Family Fund.

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See editorial, page 233.

rheumatic fever from May, 1975 through June, 1976 with the onset of the disease within four months of the date of reporting to the Minnesota State Department of Health rheumatic fever registry were sought for evaluation. This method was selected so that the details of the case and the physician and/or hospital records would be current. The proposal was endorsed by the Heart Committee and the Council of the Minnesota Medical Association before the study was begun.

Reporting physicians were contacted initially by a letter explaining the purpose of the study and enlisting their cooperation. A questionnaire requesting specific information about the clinical course and laboratory findings was then sent to each physician. Shortly thereafter each physician was contacted by telephone by one of us (D.D.). An appointment was made for a more detailed review, either in person or by telephone. Confidentiality was assured for both physicians and patients. The records and charts were reviewed and the cases were discussed directly with the physicians for 55 of the patients; for five cases the chart was reviewed and discussed with a physician's nurse or medical secretary. In the latter cases, when questions arose the nurse or assistant was requested to contact the physician for the specific information requested.

The information was carefully reviewed by us (independently and collectively). Cases were felt to fulfill the revised Jones' Criteria[4] if two major criteria or one major and two minor criteria were clearly identifiable and there was evidence of a preceding infection with group A beta-hemolytic streptococci. The presence of Sydenham's chorea, however, was considered sufficient for the diagnosis.

Results

A total of 245 cases were reported to the registry during the study period; sixty-four patients (26.5%) met the criteria (see above) for selection. Cooperation of the reporting physicians was obtained for 60 (94%) of the 64 patients.

Table 1 shows the diagnostic criteria for the 60 patients included in this analysis. The mean age of the 60 patients was 11.3 years (range three to 20 years). Sixty-four percent (39/60) were reported to have acute arthritis, although in only 30 patients was it recorded as migratory polyarthritis; the other nine cases had monarticular arthritis. Less than 20% of the 60 patients had findings which were interpreted to represent unequivocal carditis. This judgment was made on the basis of evidence of at least two of the following: congestive heart failure, electrocardiographic changes, and/or a carefully described murmur compatible with mitral valve disease or combined mitral and aortic disease. Four patients (7%) had Sydenham's chorea. Erythema marginatum and subcutaneous nodules were rarely reported. As expected, most of the sixty patients had fever, a positive test for acute phase reactants (elevated erythrocyte sedimentation rate

TABLE 1

Jones' Diagnostic Criteria for Reported Cases of Rheumatic Fever (60) Meeting Criteria for Inclusion in this Study

Major Criteria	Number of Patients	(Percent of 60 Patients)
Arthritis	39*	(65)
Carditis	11	(18)
Chorea	4	(7)
Erythema Marginatum	4	(7)
Subcutaneous Nodules	1	(2)
Minor Criteria		
Fever	44	(73)
Arthralgia	17	(28)
Previous Acute Rheumatic Fever	2	(3)
Positive Acute Phase Reactants (sedimentation rate and/or C-reactive protein)	49	(82)
Evidence of a Preceding Streptococcal Infection		
Positive Throat Culture	21	(35)
Antistreptolysin 0 (≥ 333 Todd Units)	41	(68)
Anti-DNase B (≥ 240)†	1	(2)
Total with evidence of previous Streptococcal Infection	46	(77)

*30 had migratory polyarthritis and 9 had monarticular arthritis.
†This streptococcal antibody test was infrequently performed, thus accounting for the single patient with an elevated titer.

and/or a positive C-reactive protein), and evidence of a preceding streptococcal infection.

Findings from thirty-four (57%) of the 60 patients were felt by the investigators to adequately fulfill the revised Jones' Criteria for the diagnosis of acute rheumatic fever. The clinical and laboratory findings of these 34 patients are compared with findings from the remaining 26 patients in Table 2. Two-thirds of the 34 cases felt to satisfy Jones' Criteria were male; the mean age of these 34 patients was 11.5 years. Among the 26 patients who did not fulfill the Jones' Criteria the mean age was 10.7 years and 46% of this group were males.

Of the 34 patients who fulfilled the Jones' Criteria the most common presenting complaint was migratory polyarthritis (82%); carditis was less common, occurring in only seven (21%) of the cases. Twenty-five (89%) of the 28 patients with arthritis had polyarthritis. In the three patients in this group who had monarticular arthritis the arthritis was not necessary to satisfy the Jones' Criteria. Sydenham's chorea, erythema marginatum and subcutaneous nodules were rarely present in this group. None of these 34 patients represented a recurrent attack.

Of the 26 cases reported to the registry but judged not to fulfill Jones' Criteria there were ten (38%) who, upon review, had no evidence of any of the major criteria. An additional six (23%) had monarticular arthritis as the only "major" criterion; five of these six would not have satisfied Jones' Criteria even if monarticular arthritis was accepted as a major criterion. There were two cases with no minor criteria and fourteen patients lacked documented evidence of group A streptococcal infection. Four of these 26 cases failed to fulfill the Jones' Criteria only for lack of evidence of a previous streptococcal infection; two were tested too late for a throat culture or results of streptococcal antibody titers to be meaningful and two had no record of these tests ever being ordered. It was felt during detailed review that in these four patients rheumatic fever was nonetheless possible, though not proven.

The month of onset for all of the cases is shown in Figure 1. A bimodal distribution was seen. The peak incidence of acute rheumatic fever in those felt to satisfy the Jones' Criteria (hatched area) occurred in early spring (March and April), although there was also an increase in the number of cases reported in November.

Table 3 shows the method of secondary rheumatic fever antibiotic prophylaxis recommended by the physicians of the patients described in this report. It is of interest that despite the recommendations by the American Heart Association that intramuscular ben-

TABLE 2

	Fulfilling Jones' Criteria (34 patients, 57%)		Not Fulfilling Jones' Criteria (26 patients, 43%)	
Major Criteria	**Number of Patients**	**(Percent)**	**Number of Patients**	**(Percent)**
Arthritis	28*	(82)	11	(42)
Carditis	7	(21)	4	(15)
Sydenham's Chorea	4	(12)	0	(0)
Erythema Marginatum	4	(12)	0	(0)
Subcutaneous Nodules	1	(2)	0	(0)
Minor Criteria				
Fever	27	(79)	17	(65)
Arthralgia	4	(12)	13	(50)
Prev. acute rheumatic fever	1	(2)	1	(4)
Positive Acute Phase Reactants (sedimentation rate and/or C-reactive protein)	29	(85)	20	(81)
Evidence of Preceding Streptococcal Infection				
Positive Throat Culture	12	(35)	9	(35)
Antistreptolysin 0 (≥333 Todd Units)	29	(85)	12	(46)
Anti-DNase B (≥240)†	1	(3)	0	(0)
Total with Evidence of a Previous Streptococcal Infection	34	(100)	13	(50)

*25 had migratory polyarthritis and 3 had monarticular arthritis.
†This streptococcal antibody test was infrequently performed, thus accounting for the single patient with an elevated titer.

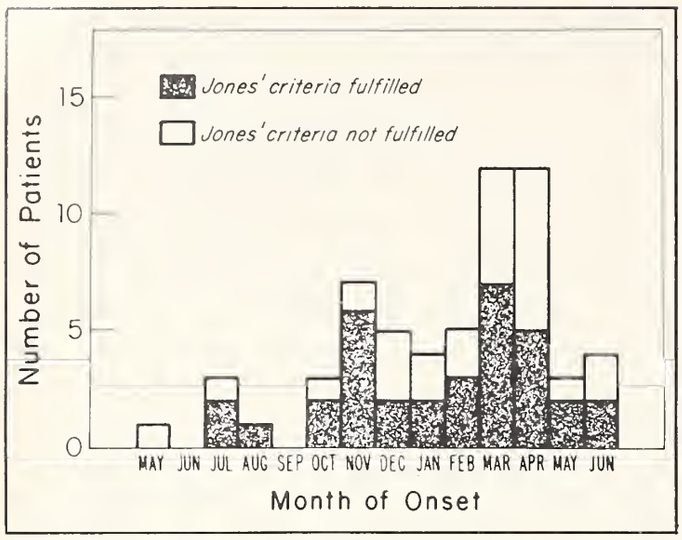


Fig. 1—Bar graph showing month of onset of reported cases of rheumatic fever in Minnesota during the 14 month study period.

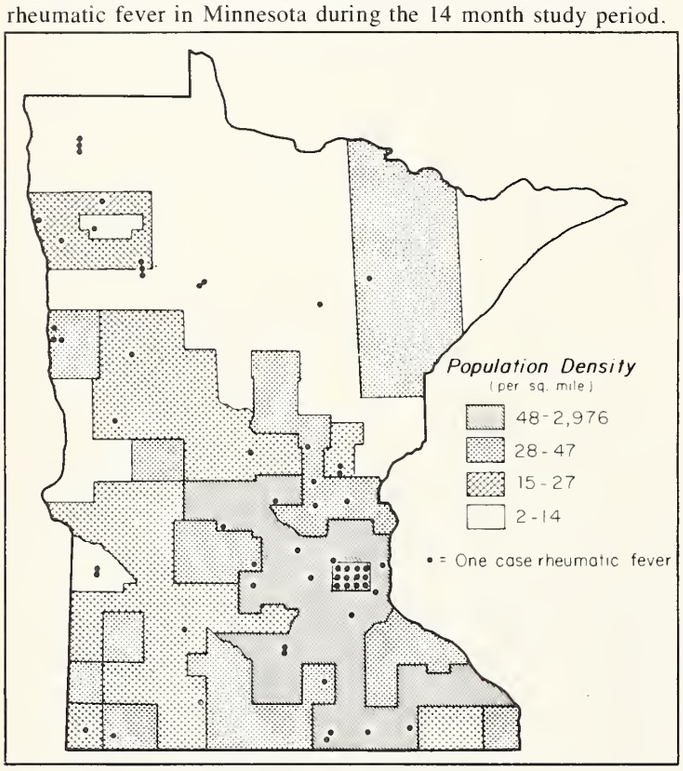


Fig. 2—Population density map of Minnesota (obtained from Minnesota Health Department) showing county of origin of 60 reported cases of rheumatic fever.

zathine penicillin G is the method of choice for secondary prophylaxis,[6] almost 90% of the patients were receiving oral antibiotics. Furthermore, there were several patients in whom no secondary rheumatic fever prophylaxis was recommended even though a diagnosis of acute rheumatic fever had been made by the physician.

The geographic distribution (county of residence) of the 60 studied cases was superimposed on a population density map of the state of Minnesota (Figure 2). Each patient is represented by a single dot on the map. There appeared to be populous areas of the state (e.g., St. Louis County) where one might have expected cases of rheumatic fever, but none were reported to the registry during the study period. About 25% of the cases came from the Twin Cities metropolitan area, yet this area has a somewhat larger proportion of the state's population. This suggested underreporting of cases.

Discussion

The records of 60 patients, 20 years of age and younger, whose onset of acute rheumatic fever had been within four months of reporting to the State Department of Health rheumatic fever registry were evaluated. Among the sixty patients, 34 (57%) of the patients met the revised Jones' Criteria; there were another four (making a total of 63%) in whom the diagnosis was very likely, but who did not qualify only for lack of evidence of a preceding streptococcal infection. The remaining 22 cases (37%) could not be confirmed as bona fide cases of rheumatic fever by careful objective review of clinical and laboratory data.

The incidence of individual diagnostic criteria was similar in some respects to that reported by Perlman and colleagues among reported cases of rheumatic fever in Minnesota from 1960 through 1963[1] and also

TABLE 3

	Recommended Secondary Prophylaxis for Prevention of Rheumatic Fever					
	Total		Fulfill Jones' Criteria		Do Not Fulfill Jones' Criteria	
	Number of Patients	(Percent)	Number of Patients	(Percent)	Number of Patients	(Percent)
Oral Penicillin	49	(82)	28	(82)	21	(81)
Intramuscular Benzathine Penicillin G	5	(8)	2	(6)	3	(11)
Oral Sulfadiazine	3	(5)	2	(6)	1	(4)
None Recommended	3	(5)	2	(6)	1	(4)
TOTALS	60	(100)	34	(100)	26	(100)

somewhat similar to the findings of a more inclusive evaluation by Finkelstein (between 1960 and 1969).[3] Perlman found migratory polyarthritis to be present in approximately 69% of the cases, carditis in 53% of the cases, chorea in 6%, subcutaneous nodules 5.3% and erythema marginatum was also present in 5.3% of the cases. Of the minor criteria, an elevated erythocyte sedimentation rate or white blood cell count was found in 74% and an incidence of documented previous episode of rheumatic fever was obtained in 15% of the patients. The Finkelstein evaluation, which included a larger number of patients, did not differ significantly from these figures.[3]

Migratory polyarthritis has been the most common of the major criteria found to be present in rheumatic fever in all studies from Minnesota. The most striking difference between the previously reported data and the data from the present study is the higher incidence of carditis reported previously (approximately 53%). The selection process used in the current study may at least partially explain this discrepancy, as patients with chronic rheumatic heart disease and adults with newly diagnosed rheumatic heart disease were excluded from our evaluation. Also the fact that the patients described here had only recently been reported to the registry may have had an effect, since it was probably easier for us to obtain an accurate history. Only four patients who had persisting murmurs at the time their physicians were interviewed were found among these 11 patients thought to have had carditis during the initial attack. In the current study only three cases were described to have a rash which was compatible with erythema marginatum (9%); this is similar to previous reports from this state.[3] Chorea was reported in 12% of the patients. There was only one description of subcutaneous nodules; this finding appeared rather questionable.

Among the minor criteria, a much smaller percentage of patients reported arthralgia (28%) when compared with Perlman's report (64%).[1] This could be due to the fact that we included arthralgia as a minor criteria only in the absence of arthritis.

In over 75% of our 60 patients was there evidence of a preceding streptococcal infection, a higher figure than that reported by Finkelstein.[3] This difference may again have been influenced by the fact that we made early attempts to confirm this information.

Comparing the findings between the two groups reported here (i.e., those fulfilling and those not fulfilling the revised Jones' Criteria), a higher incidence of all the major criteria was noted in the former group. Of the four cases of highly suspected carditis among those not fulfilling the Jones' Criteria, three were among those felt to probably represent acute rheumatic fever despite the lack of evidence of preceding streptococcal infection. This represents a total incidence of carditis of 26% in those patients with good evidence for the diagnosis of rheumatic fever. Arthralgia was more common in the group not satisfying the Jones' Criteria. Indeed, the combination of arthralgia and fever with or without documented streptococcal infection was a very common clinical presentation among this latter group. We believe that this is an important, but perhaps not unexpected, finding.

With regard to preventability of rheumatic fever it was noted that of the thirty-four patients that met Jones' Criteria plus the four others who met criteria but had no evidence of streptococcal infection, there were eight (21%) who had a sore throat for which medical attention was not sought and seven (18%) who were seen by a physician because of pharyngitis before the onset of symptoms of rheumatic fever. Thus, fifteen of the 38 patients (39%) could be assumed to be preventable through improved patient education and compliance, and perhaps increased physician awareness of appropriate diagnostic methods and therapy for streptococcal pharyngitis. The remaining twenty-three of the 38 patients (61%) either had no history of a sore throat or had complaints or evidence of pharyngitis only concurrently with the symptoms felt by the physician to represent rheumatic fever; in these patients that episode of pharyngitis would not have been the responsible infection.

Table 3 shows that 80% of the total cases reviewed and 82% of those meeting the Jones' Criteria were taking oral penicillin for secondary prophylaxis for prevention of rheumatic fever. This is similar to both Perlman's and Finkelstein's findings, both reporting 87% of patients receiving oral penicillin prophylaxis.[1,3] These findings are noteworthy, especially because the prophylactic regimen of choice according to the American Heart Association recommendations is and has been intramuscular benzathine penicillin G, 1,200,000 units once a month.[6] This recommendation is based upon data comparing secondary rheumatic fever prophylaxis using oral penicillin or oral sulfadiazine with intramuscular benzathine penicillin G[7]; benzathine penicillin G was clearly superior to oral antimicrobial agents. Less than 10% of the cases reported here, however, were receiving intramuscular benzathine penicillin G. Oral sulfadiazine was used in those instances of established penicillin allergy (5%). A disturbing finding was the observation that in three cases (two of which were felt

to have fulfilled the Jones' Criteria) no continuous secondary prophylaxis had been recommended.

Summary and Conclusions

A selected sample of 60 cases of acute rheumatic fever in patients twenty years of age or younger reported to the Minnesota Department of Health from May, 1975 through June, 1976 was reviewed. Upon retrospective review a large proportion (43%) of the evaluated cases did not adequately fulfill the revised Jones' Criteria, which is the accepted minimal standard for diagnosis of rheumatic fever.[4] Thus "over-reporting" of rheumatic fever would appear to occur in Minnesota. Conversely, in considering the geographic distribution of reported cases, "under-reporting" also occurs. Both over and under-reporting of rheumatic fever have been noted previously in Minnesota and elsewhere.[1,8,9] Because of the effect of these errors, our data indicate that it is not possible to arrive at the true current incidence of rheumatic fever in Minnesota.

The clinical features of cases occurring recently in Minnesota are similar to those reported previously with the exception of an apparent decrease in the reported frequency of carditis; this has also been commented upon by others.

It was found that the majority of the patients with rheumatic fever are receiving oral penicillin as secondary prophylaxis (prevention of recurrent attacks), rather than intramuscular benzathine penicillin G which is and has been the recommendation of choice by the American Heart Association.[6]

An apparent need for physician education was revealed especially regarding application of the Jones' Criteria and for selecting the optimal regimen for secondary antibiotic prophylaxis. Our data also indicate the need for an accurate assessment of the current incidence of rheumatic fever in the state of Minnesota *prior* to undertaking streptococcal surveillance programs (e.g., in schools), especially if one ultimately is to be able to evaluate the effect of surveillance programs on the incidence of acute rheumatic fever in Minnesota.

Acknowledgment

The authors are grateful to the Minnesota Department of Health, and to the Minnesota Affiliate of the American Heart Association for cooperation and assistance during the study. We would like to acknowledge the endorsement of the Heart Committee of the Minnesota Medical Association. To those physicians who gave their time and allowed review of their records, we express special appreciation.

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Recent studies have reported that the percentage of staphylococcal isolates resistant to penicillin G outside the hospital is increasing, approximating the high percentage of resistant staphylococcal isolates found in the hospital. For this reason, it is recommended that a penicillinase-resistant penicillin be used as initial therapy for any suspected staphylococcal infection until culture and sensitivity results are known.

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(Continued from page 281)

Letter to the Editor

A Legislator's View of Health Expenditures

Dear Editors:

Senator John H. Milton in "A Legislator's View of Health Expenditures"* is appropriately concerned and attempting to be objective about the high cost of health care, but his proposed causes and consequently his solutions are somewhat an error.

First he perceives the entrepreneurial physician as a major problem and suggests that this commences with and is encouraged throughout medical school. If there is one thing that cannot be blamed on the medical schools it is this entrepreneurship which in our regulated capitalistic society is ingrained from childhood. This entrepreneurship of physicians and hospital administrators may not even be adding to cost. The incentive for profit or at least a break even point promotes a cost holding efficiency lacking in most government systems.

The Senator says he makes no value judgments but implies that physician dominance greatly adds to cost. He says nothing of quality and is likely unaware that the United States went the "barefoot doctor" route prior to the Flexner report, found that it was infested with charlatans and unqualified ones at that and discarded it in favor of our present system. China uses "barefoot physicians". They also use nightsoil for fertilizer and have rampant parasitic disease. When the Senator is ill would he accept his access through a practitioner other than a physician? Hopefully he does recognize that physician extenders, allied health practitioners, or barefoot physicians may simply add another layer of cost.

Facilities, capital, and technology are intricately involved with health care cost, but the Senator like most critics has not been astute enough to perceive that it is not new technology itself at fault. The problem is that new technology does not replace old technology but merely becomes additive. There are not less gastrointestinal X-rays, intravenous pyelograms, angiograms, brain scans, or skull films done since the advent of ultrasound or CT scanners. A solution to this dilemma is to re-educate physicians and patients in clinically appropriate cost effective testing and possibly to initiate peer review of ancillary services. Also certificates of need should be broadened to include private offices where the economic incentive of physicians requesting laboratory or X-ray services is currently in direct conflict with medical necessity.

It has been "traditional rhetoric" among consumers, politicians and bureaucrats that there are too many hospital beds in the Twin Cities and that reduction in beds will solve the cost problems. Many involved in the health care fields seriously question whether closing of beds or closing of entire hospitals will effect costs at all if applied as an unitary measure. Certainly more study is needed than to simply demonstrate that we have more beds than Seattle.

The problem of excessive surgery is a difficult one and the coronary bypass is especially problematic. One can select any study in the medical literature and come to the conclusion that the operation is beneficial or detrimental, take your choice. When the scientific community itself is confused and divided on the issue there is likely no one answer implying that patient selection is critical. Admittedly this allows for potential abuse but prohibiting the procedure may deny selected patients benefits not otherwise obtainable. Again perhaps review panels would help.

Do we do too many hysterectomies or too much surgery in general? Too much in comparison to what? England is a poor example with their waits of up to a year for an elective herniorrhaphy and a medical approach to many disease entities that are managed surgically in the United States. Likely we did do too much surgery in the past, but required examination of all surgical specimens together with concurrent and retrospective review is

*Minnesota Med 60:12:889, 1977.

diminishing the abuse. Many health care experts are unsure if too much surgery is done, but to simply assume that 750,000 hysterectomies per/year is excessive is a capricious and unscientific approach. Since the government is mostly concerned with cost and not quality it should be mentioned that a needed hysterectomy done at age 45 may be cheaper than treating the problem medically for the next 30 years.

The emphasis in the American health care system is not simply on treating sickness but becoming more preventive yearly. Medicine has stressed preventive measures such as immunization programs, removal of environmental carcinogens and genetic counseling and should challenge the widely emphasized dogma that is only catastrophic in approach. Most chronic diseases have long latency periods and preventive results are slow in coming but by emphasizing weight reduction, exercise, diet and control of hypertension for the last 15 years we are now witnessing a dramatic decline in cardiovascular mortality proving that education of provider and consumer has a payoff.

We do use too many drugs in this country. It is so much easier to prescribe a sedative or antidepressant then to listen to a patient. The solution again is physician and patient education.

Most consumers have health insurance and so demand the finest in care regardless of the cost. They fail to realize that their insurance premiums directly reflect the utilization of health care services. A few dollars spent in their education may pay respectable dividends.

Insurance companies should be educated that offering health care policies that cover only in-hospital care by their very nature add to cost. No compassionate physician faced with such a patient in need of a diagnostic evaluation will refuse to hospitalize.

Lastly in this plea for education for all involved as the remedy for high cost, let us demand that the government from the local level on up be enlightened that their strong involvement in the form of National Health Insurance will undoubtedly increase costs not only through increased demand for service but also through the traditional inefficiency of government bureaucracy as exemplified by the per-diem cost of hospitalized patients in the VA system.

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CME Requirements

Dear Editors:

This letter is in reference to the proposed CME requirements for medical licensure.

It is incongruous that in an era when we are proud of the scientific basis of medicine we approach the problem of competence of physicians with total lack of reason. There have been no studies to determine what the problem is and who is not competent (if any). And despite this, we have the answer: let's count CME hours even though we do not know the question. This is about as sensible as if a surgeon would treat all patients with abdominal pain with meperidine alone.

Peer review is probably the only way to judge the competence of physicians and the time honored method to test for knowledge is by examination. If we want to be sincere in our endeavor to provide the people of Minnesota competent medical care, then we should do one or both of the above. I find it difficult to swallow this meaningless Mickey Mouse of counting the CME hours.

Y.K.J. Gronquist, M.D.
Cloquet, Minnesota

Health Care Cost Commission

Choices for Medical Care

WALTER McCLURE, Ph.D.*

Testimony of many experts before this commission has underscored the seriousness of the problems facing the medical care system. This morning I'd like to talk about the range of solutions that we have available to us, at least as I see it. Let me start with a few initial points.

The first point is that physicians did not create these problems, but they are going to have to live with the solutions no matter who makes up the solutions. In fact, nobody created this problem. We have a structural problem, not a problem of people who are trying to do the nation ill.

Second, the critical problem is cost. All the good things we want to do — give everybody adequate health care and health insurance — increasingly have been pushed to the back burner because of cost. So, cost is the number one problem. And if we can't solve that, we can't solve the rest of the problems. Now, everything that we know from research and experience suggests that spending more will not make the nation healthier. In fact, the evidence is that we could reduce present expenditures substantially without threatening the health of the American people; indeed, appropriate cutting back could probably improve the quality of care.

And so there is no doubt, due to the escalating costs, that the country is going to make a substantial effort to contain costs with or without physician involvement. Government will eventually do anything and everything it has to to contain costs. And if physicians do not come forth with credible proposals — and I mean credible to a very tough-minded Congress, not pious rhetoric or well-intentioned voluntary calls for action — if physicians do not come forward with credible proposals, then Congress is going to go forward without physicians. And I think this will be bad not only for American medicine but for the American people and their medical care.

So the battle is no longer between change and no change. That battle has been lost — there is going to be change. In fact, serious change is underway right now. The question now is which change, and who will lead it; and is it really going to be any good?

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Presented before the Commission on November 11, 1977, at the Radisson-South in Minneapolis.

Now, it seems to me that we can understand all the problems of the system — runaway cost, maldistribution of services and of manpower and facilities, uneven quality — as stemming from an underlying cause. The root of these problems stems from an absence of effective market forces in the present medical care system. Effective working forces of consumer choice and economic competition do not exist in this system, and that is why we have the problems that we have.

Therefore there are really two big choices available to us. Either we will restructure the private system to establish effective market forces, or we will give up on the market and turn the whole thing over to government, who will use regulatory forces as a substitute for market forces. Or we'll do some consistent combination of both. There are no other choices. We will do one or the other or some combination.

Now, the less the market forces that we create, the stronger the regulatory forces will have to be. If there are no market forces, then we will have to convert the medical care system into a public utility, with government controlling entry into the field, prices, and performance. The stronger the market forces the less likely we will need strong regulatory forces and the more likely the regulation will work. The present incentives of our system are largely anti-aligned to the objectives of regulation. Unless these powerful incentives are altered, we will need extremely powerful regulation to counter them, and the experience and research on regulation suggests it won't work well. We'll have maximal regulation, stifling flexibility and innovation, and the regulation will not control cost nor redistribute resources appropriately. On the other hand, if we can have effective market forces in our private system aligned with the objectives of public policy, then the regulation needed to contain cost and to redistribute resources appropriately will be minimal and more likely to work.

It may well be that no purely private, market-oriented approach to the future medical care system can do the whole job without some supplemental regulation. But I am even more skeptical that there is any public utility model that can do the whole job alone without complimentary market forces. And so we have

got to do our best to get the market forces going, no matter what the role of regulation. Market forces will be needed even in any regulatory model. And if the market forces are effective enough, not much regulation will be needed at all.

I think that physicians have to face the following kind of decision. In a cost-contained world the individual professional is not going to have the same degree of freedom that he has today. He can not do everything that he knows how to do. But, there is a great deal of difference between a private system where the constraint is applied by peers operating to meet the demands of effective market forces, and restraint applied by an army of government bureaucrats, rules, regulations and requirements. The new national guidelines on health planning begin to give you a fairly real world taste of what that is going to look like. It's being applied to hospitals right now. But let's not kid ourselves that that's where it's going to stop. Eventually it will be extended to physicians, also. Already there are proposals in the Minnesota legislature to extend Certificate of Need to physicians' offices. In the absence of credible market forces, such action is inevitable.

What I would like to do is suggest market strategies and regulatory strategies that might work. And I'd also like to suggest where I think we will drift if we do nothing. I will do that in three steps. First, I'll present the problems or goals that we are trying to achieve (the problems being simply that we are not achieving the goals that we want to achieve). You can think of these as symptoms. Second, I'll discuss what I believe is the underlying cause of these symptoms. You can think of this as a diagnosis. Too much of public policy has been symptom curing, and does not get to the underlying disease if you will. And that disease is the absence of market forces. Third, I'll discuss what I believe are the alternative options, or therapies so to speak — which market strategies might work and which regulatory strategies. I'll also discuss how market and regulatory approaches might be made complimentary. Finally, I'll conclude with some suggestions about what physicians might do to help constructive solutions along.

The Problems (Symptoms)

I think we can set out the problems and objectives in terms of four goals. Any credible solution must meet these objectives. If it does not, it will not prove acceptable. First, it must allow us to provide adequate financial protection and financial access to all Americans. We don't want anyone bankrupted for receiving necessary care and we don't want anyone denied necessary care because of inability to pay. In fact, it is the social and political actions taken over the last thirty years to achieve that objective which have destroyed the market forces in the system. Second, we want medical care distributed equitably. We don't want any group in our society receiving substantially less levels of service than the average. Third, we want medical care to be effective. We want value for our money, and I will state that as follows: we want to get the maximum health possible from the dollars we are willing to invest in medical care. Lastly, we want to do all these good things at a cost the nation can afford. We can no longer afford a medical care system that eats the nation out of house and home if we try to buy in for the poor, the old, and the sick.

Now how do we stand on each of these objectives? You probably are aware that five to ten percent of the population have no coverage, and another ten to fifteen percent have coverage that all of us would agree is inadequate. An average hospital episode would exhaust the benefits and would severely hurt the family financially. The impact is that ten percent of the households in this country pay directly out of their own pockets (e.g., excluding government and employer contributions) in excess of fifteen percent of their annual income for health care and health insurance. And four percent of households in this country pay in excess of 25 percent of their annual income for health care and health insurance. And most of them are old or poor or both. I question whether a society as rich as the United States can look with much pride on that fact.

Regarding distribution we have made great strides. The receipt of services used to be directly proportional to income. The more one earned the more services one got. Since Medicare and Medicaid that has substantially changed. Today the poor are receiving on average the same level of services as the middle class. Nevertheless, these averages still hide substantial pockets of inequity. For example, if you are ineligible for Medicaid you receive thirty percent less services than if you are eligible for Medicaid. Also, service levels should probably be somewhat higher for the poor than for the middle class. The poor are a sicker group overall.

Regarding quality, perhaps the most scandalous thing is that we don't have any reliable nationwide studies. We do not know what quality is across the nation because we don't measure it. The studies that have been done show, for example, among leading hospitals that after you've controls for everything you can think of — age, sex, diagnosis, severity, etc.

case fatality rates vary more than threefold. Let us acknowledge that the evidence suggests that at its best American medicine is the best in the world. But let us also acknowledge that such evidence as we have also suggests that there are many places where we are not achieving the results we know how to achieve with established clinical knowledge. These failings apparently have less to do with individual clinical competence than with failures in system linkages to bring the patient and all the necessary services together to get optimal results.

Finally, regarding cost, you have all heard over the last few weeks in this committee that medical expenditures are escalating at one and a half to two times faster than the rest of the economy. We shall simply have to bring the rate of increase down much closer to the rest of the economy. By cost containment we don't mean cutting expenditures below present levels; we mean bringing the rate of increase in expenditures in line with growth rates in the rest of the economy (or maybe slightly above, because we find that as incomes increase, people want to buy somewhat more health services). But we cannot have an industry that represents 8.5% of our G.N.P. (gross national product) inflating at twice the rate of the rest of the economy. That is unacceptable. That is an expenditure so large that it is no longer an issue of health care, it is an issue of national priorities. We seem to have turned our medical care system into a giant vacuum cleaner that sucks up uncontrollable amounts of scarce tax dollars and G.N.P. and puts it ineluctably to medical care. And so you can believe that Congress is eventually going to have to get on top of this problem, and it will keep trying until it does so.

Underlying Causes (A Diagnosis)

Those, I think, are the objectives that we have and the problems that we are having. But why are we having them? I think that we can put the cause in terms of a dilemma. Then I will come back and be a little more systematic about it.

To see our dilemma, on the one hand we are saying our objective is that health care should be distributed based on some standard of need rather than on personal income or circumstance. We have begun to implement that objective with Medicare and Medicaid, and we will not retreat on that. There is no history of any nation relinquishing benefits, once granted. So we are irreversibly into it. On the other hand — and this is the dilemma — we already know how to practice a style of medicine right now (without inventing one new piece of technology and of course we're doing that all the time) which if extended equally to everyone in this country would bankrupt us. We know how to practice a style of medicine which, if given equally to all, would cost far more than this nation would or should pay for medical care. So the issue is: in a cost-contained world we shall not do everything we know how to do. We shall have to prioritize medical care. But there is no way that the present system can cope with priorities. There is no way now that one physician can withhold resources from his patient just because the patient of some physician down the street would benefit more from those resources. There is neither mechanism nor incentive in the present system to prioritize medical care, yet that is what we have to do if we are going to contain costs.

We can no longer provide everything for everybody everywhere at any time — at the lowest sound cost, of course. Because the lowest sound cost of such a policy exceeds the national treasury. Consider for example the recent case of a prominent wealthy family whose elder member had a stroke, and the family spent upwards of a million dollars on his rehabilitation. Is that to be the standard of stroke care for everyone in this country? Obviously not. Consider coronary by-pass surgery. There is a hot argument between surgeons and medical people as to the value of this procedure. We still do not know how effective it is, and who it should be done on, to get the maximum effect. There has been no random clinical trial, and yet this new procedure costs $10,000 and more a throw. And, according to some of my more enthusiastic surgical friends, there are potentially four million people out there who are candidates for this surgery. That's forty billion dollars on one procedure which has never been rigorously evaluated clinically. We know that for some people it saves life and can relieve serious angina, and that is a major accomplishment. But we know for a lot of people it does nothing, and some people it kills. Now if you had forty billion dollars to spend on the health and well-being of the United States, would you put it to one medical procedure that had not yet been rigorously evaluated? Would you even put it solely to medical care, knowing that things like keeping drunk drivers off the road and feeding poor children would do a lot more for health in this country than more medical care. The problem is that it makes no difference what we would decide. In the present system we have no control. Whatever the present system does we are committed to pay for it. And that can't continue.

By this of course I do not mean that medical care is unimportant to health — it's very important. It's just not important at the levels that we provide it. There is a

curve of diminishing marginal returns — health versus the dollars that we spend on health. That curve rises sharply at first but then flattens out. For the first few dollars that we spend (to immunize people, set broken bones, and so on) we receive a lot of health for our buck. But as we go on making additional investments, we find eventually that we are spending huge amounts of money in return for more and more marginal health benefits to fewer and fewer people. And when we are now putting a coronary care unit, and a CAT scanner, and a DOG scanner, and whatnot in every hospital, we may in effect not only be spending enormous amounts of money to achieve very little helpful results, we may in fact be worsening the situation. Ten over-equipped, under-utilized hospitals are not only a danger to your pocketbook, they are a danger to your health. We'd be much better off, economically and clinically, with eight well-equipped, well-utilized hospitals. The patient load has to be sufficient to maintain the clinical skills of the team.

Because of the law of diminishing marginal returns, the best conceivable medical care is a monster. It is no more desirable nor affordable than the best conceivable defense system or the best conceivable educational system. If I gave ten billion more dollars to the generals, they could immediately find legitimate ways to spend it improving our national defense. Ten years ago we couldn't fall over ourselves fast enough to hand money to our generals. We used to fall over ourselves to give money to our educators — remember the post-sputnik era? We've become more cautious about education and defense. And we shall have to adopt the same kind of constructive skepticism in health care as we have in defense and education. In practice, the best conceivable of any one thing is seldom worth the money. There are many competing social needs. What we want is the best balance among them giving us the greatest human well-being for our limited resources. Trade-offs are necessary. If we overspend for medical care, the health and well-being of the United States will be reduced.

We cannot afford to do everything we know how to do. We shall have to prioritize. We shall have to shift from the "everything for everybody" philosophy which we can't afford, to a philosophy of "that which will do the most good, to those whom it will benefit most, within the means society is willing and able to put to medical care." This will require a profound change . . . not only in the organization and attitudes of providers but in the attitudes and expectation of patients.

Let us turn to diagnosis. Earlier I suggested that the diagnosis for our problems is an absence of market forces. I would like to explain what I mean by that, so that I can motivate the possible solutions. By effective market forces I mean strong private sector incentives that reward not only the provider but the consumer — both consumer and provider — for making wise choices among costly resources. Presently such incentive forces do not exist in our system, and I want to back that up. We can say that systems of people — including the medical care system, or government bureaucracy, or corporations — behave the way that they are structured and rewarded to behave. And the medical care system is misbehaving, if you will, exactly the way that society has structured and rewards it to misbehave. It is not a problem of doctors or hospitals out to do the public ill; in fact they are trying to do us too much of their kind of good. Even if we had a group of saints and put them in our medical care system, we would produce exactly the same performance that we are observing. The problem is not conspiratorial, it is structural. And so we need to understand the structure and incentive factors that are producing the present behavior of the system.

Now the first point is about medical care itself. Medical care is indefinitely expandable. We can always legitimately do more. Why do $50 worth of tests to be 90% sure of your diagnosis if you can do $250 worth of tests and be 93% sure of your diagnosis? That's not bad care, that's good care. If you've got more and more hopeless patients, and someone will pay, why not do all the expensive things that we can figure out to do in the hope that we might save the one in a thousand. That's not bad care, that's good care. We can always screen for rarer and rarer diseases. If an annual physical is good, why not a semi-annual physical? We can carry these things as far as we want; they are not bad medical care, they are good medical care. The objection is simply that they are cost-ineffective medical care. If you took the same money and put it to improving lifestyle, cleaning up the environment, better nutrition, etc., you would get a lot more health for your money. So we can pose a medical Parkinson's law: standards and styles of practice will escalate to absorb the dollars available.

Now, secondly, the incentives in the present system are powerfully skewed towards the high cost end of this endlessly expansible medical care spectrum. For example, one of the most powerful incentives that operates here is professional challenge and reputation. We want people to think good of what we do, and doctors and hospital people want their colleagues to think they are good at what they do. So they do those

things which build professional reputation. And those things tend to be arcane, highly technological things. We do not get professional brownie points for going out and treating five or six thousand clamoring general practice patients in North Waterpump, Minnesota. Professional reputation accrues to practicing in the metropolitan medical temples, playing with the blinking lights and rearranging people's innards. Prestige accrues with dealing with horizontal patients, not vertical patients.

A second powerful incentive is financial. We pay doctors fee for service, we pay hospitals their cost. That is a veritable financial engine to generate more services, more complex services, and more costly services. You pay me cost, and I can certainly increase the costs of what I do. Now, some people claim that providers are deliberately over-providing services to rip off the public; that is simply not the case. Rather the case is that such open-ended financing creates a "spare-no-expense" atmosphere. The emphasis becomes solely quality and hang the bill. I suggest each physician here compare to himself his office practice with his hospital practice. In the office I suspect you keep costs more in mind. The patient probably isn't covered, certain tests may require the inconvenience of his going elsewhere or coming back, and so on. But once the patient gets in the hospital where it's covered and everything is available, you just forget about cost. You do everything that occurs in your mind that might help. And a lot of those things make little or no difference.

Another perverse incentive comes from our legal doctrine where if you as the physician don't do everything that some judge in his wisdom deems is the standard of medical care, no matter how superfluous or unnecessary you might think it, you're in trouble if something untoward happens and malpractice is brought against you. Particularly perverse incentives are created by the fragmentation in the system. That is, we have separate primary physicians, separate specialists, separate hospitals, and so on. And frequently the costs and savings created by one unit in the system do not come back to it, they come back to some other unit. That's what the economists call externalties, and it leads to uneconomic behavior. You are not rewarded for appropriate use of resources. For example, the hospital is a free shop to the doctor. So he has no reason not to over-use that very costly resource. For another example, hospitals and medical staff are independent. Hospitals do not win patients by being efficient. They win patients by adding doctors to their medical staff, and so they compete for medical staff, and they provide everything that will draw doctors to them. And if they don't, these incentives will kill them.

These incentives are not academic, they are very real, powerful forces. There is a hospital in this town where the chief of the medical staff got very conscientious and instituted a very tough admissions and length of stay review. And he lowered the census from 280 patients a day to 190 patients a day and put that hospital on the financial rocks. Now his Board did not hire him to do this, and if he didn't turn that census around, the Board would replace him with someone who would. I don't know how many physicians left the staff of that hospital because of that conscientious effort. But if you have a situation where the incentives in the system penalize you for achieving public objectives, do not expect that system to achieve public objectives. Expect it to do what it is structured and rewarded to do.

The last incentive factor that we should discuss is third party reimbursement. We have a system that can always legitimately do more. The incentive forces point the system toward the high cost technological end of that spectrum. And third party coverage virtually opens the national treasury to underwrite these tendencies. In essence, insurance lowers the price to the consumer, so that he has no incentive to be cost-conscious. It gives a virtually blank check to the provider, so that he has no incentive to be cost-conscious. And it places payment in the hands of an insurer in no position to control anything. If that insurer intervenes between the patient and the provider, then the patient looks for a new insurance company (unless he is in Medicaid and has no choice) and the provider starts refusing to serve subscribers of that insurer. That pretty well keeps the insurers in line.

Taken together all these structure and incentive forces constitute a veritable engine to escalate costs. When someone else pays, we all want the best, no matter how marginal the added benefit may be. And doctors and hospitals want to give it to us. The same structure and incentive factors explain the other problems we are having in the system. Consider maldistribution problems. Why should I go out to rural Minnesota and treat five or six thousand clamoring general practice patients with no back-up doctor to spell me off, when I can come to the big city and treat a dozen or so dialysis patients and make just as much income? There is always some legitimate exotic sub-specialty or service in over-served areas that a physician can go into, as long as insurance will pay. And so what happens is we keep on piling up services

and prices on the fixed group of people in attractive urban areas, and there is no incentive to move out to underserved areas. There is no way the present system can "saturate" in areas of surplus manpower and facilities, so there is no mechanism which drives them out. Unlike McDonald's hamburgers — you can only sell so many McDonald's hamburgers in the city and then, if you want to grow, you have to go out to the rural area and put in a McDonald's stand out there — that doesn't happen in medical treatment. You can't saturate, so you get maldistribution.

Strategy Options (Alternative Therapies)

Okay, what can we do to change all of this? We're going to have to change the incentives. More precisely, we shall have to restructure the present system to the extent necessary to alter or counter the present incentive forces producing the problems. I mentioned earlier that we had two big choices: a restructured private market-oriented system or a public regulatory approach. I want to suggest two market models that might work and then two regulatory models, one of which I think might work and the other one that we're drifting into now if we do nothing further.

Strong Cost-Sharing

The first market model that might work is proposed by Professor Feldstein of Harvard and Professor Pauly of Northwestern. It is based on strong cost-sharing by consumers. It argues that if insurance removes the incentive on consumers to use medical care prudently and choose efficient providers, then let us get rid of insurance. Now that's obviously carried too far, because we want to financially protect people. But what it says is let's get rid of the front end of insurance. In other words let's have a new kind of insurance, called "major risk insurance" in which we put very substantial deductibles and co-insurance amounting to about 10 percent of a person's income. Any medical expenditures above 10 percent of income will be totally covered, so people are very well protected from undue expense. But below 10% of income, people must pay their medical bills out of their pockets (10% is too much for the poor. We obviously have to income relate the cost share. For the near poor we might lower it to 5% of income, and for the very poor we would cover everything 100%.) But for the majority of us in the middle class who are well able to afford it, the cut would be at 10%.

Now, there is substantial evidence that if we did that, medical care costs would be contained. We would have to do a little supplemental regulation on expenditures above the threshold, but most of us would be paying most of our medical bills out of our own pocket. We would not have to be asked or begged or pleaded with to get a second opinion. We would constantly be pressuring our doctor "gee that's awfully expensive, isn't there something a little less expensive that we could try first?"

For example, the most common surgical procedure is a tonsillectomy. There are two ways to treat tonsillectomies. One, you can put the child in the hospital and yank the tonsils. The other is, you can send him home, medicate him, bedrest, and you observe him, and if after a year he still has the problem then you take the tonsils out. So we can say that there are two medically acceptable ways to treat tonsil disease. They may be equally acceptable medically, but they are not equally acceptable financially. These differences in style are the key to cost containment. The key is shifting to lower cost styles when they give as good (or better) results as high cost styles. If we practiced this lower style of treating tonsil disease, then 80% of tonsillectomies in this country would be obviated.

Now, if the consumer has his own money at stake, he will be motivated to become a much wiser, more prudent buyer of medical care, and he will pressure providers to become much more prudent suppliers of medical care. Consumers may not always be good judges of medical care, but in my opinion they are the best judges of medical care. I respect this solution enormously because I don't want government to take my money away from me and say I will get this medical care in return. I would prefer to have my own money and make my own decisions about what medical care I want.

There is a lot of research on this and it suggests that this proposal might work. It could contain cost without harm to the health of the American people. However, the problem with this solution is that I don't see much hope of getting there from here. I can't imagine Tobey Lapakko* going back to her union folks and saying, "I've got this wonderful health insurance plan: it takes away all your front-end benefits." I can't imagine Senator Staples getting too enthusiastic about going back to her district with this plan. We have good evidence that people want comprehensive insurance, not big deductibles. The moral of the story then is that we may not be able to get there, but let's not forget about this. Let's not give away the cost-sharing that we

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have now. I would not like to see the United States get into the position of Canada where all consumers feel that medical care is "free." And of course their providers give them all this "free" medical care, and the poor government is left trying to hold the fort against the rising cost. The consumers will not even support the government on necessary regulation. I predict in such a world that the providers will eventually become heroes defending the public against the stingy government. But, on the other hand, providers would have to practice medicine out of a recipe book written in Washington, D.C. It is not a very pretty picture.

Competing Health Delivery Plans

Okay, given that there is going to be comprehensive insurance, how do we install market forces in a world of comprehensive insurance? The second market approach, developed by InterStudy, addresses this question, and it goes something like this: Under the present system there is no reward for consumers to choose efficient providers. You could go to the most expensive hospital or the most efficient hospital, and your insurance will pay and your premium is unchanged. If you are a provider, you are penalized for being efficient. You are paid less if you order fewer, more appropriate services, and your efficiency, far from being a selling point to consumers, is irrelevant and even invisible to them. We can change that if we create groupings of providers, among whom consumers can choose for comprehensive care, such that the premium reflects the efficiency of the provider grouping chosen. Let's run that one by again. Let us consider a health care system where providers are organized into groupings competing for consumers. Call these provider groupings "health care plans ,"as distinct from health insurance plans. Health care plans provide care; health insurance plans only pay for it. Each plan can be organized in any way the participating providers wish. Thus they can include most existing professional arrangements with rather minimal modification. For example, the most organized type of plan would probably be a hospital-based, group practice HMO. The least organized might be an "alliance" of independent solo fee-for-service doctors and hospitals.

Consider the HMO example. It is not the fact that they are HMOs, not the way that they are internally organized, that creates market forces. What creates the market forces is that we draw a circle around a specific group of doctors and hospitals, and we say to the consumer if you choose these providers as your source of care, then you will pay a premium X which is different than premium Y if you go to anybody under, say, Blue Cross. And so you have a choice. And if you pick the more efficient plan you will be rewarded by a lower premium and greater benefits. And a more efficient grouping of providers will be rewarded by having your business, and the less efficient groupings of providers will be penalized by less business. That's called a market system.

But a provider grouping need not be tightly organized into an HMO to be efficient. Many solo fee-for-services doctors already practice efficient, conservative medicine. They could create market forces under comprehensive insurance if they would participate with selected, equally efficient colleagues in what we call a "health care alliance," which is probably the most loosely organized type of health care plan. An alliance is almost a conventional insurance plan, but with an important difference. It defines a specific set of providers accountable to provide, directly or through referral, the medical care to enrolled consumers. For the alliance to reimburse a service, the enrolled consumer must agree to go to a participating provider or to providers referred by participating providers. (To assure good choice and competition, an alliance must not be permitted to be a monopoly of every provider in town. Then it is just an insurance plan, and no economic competition among groupings of providers is created.)

As an example, think of an alliance called the Gold Cross plan, wanting to compete against Blue Cross. The Gold Cross plan organizers — might be physicians or others — look around the community for efficient, high quality doctors and ask them to participate. In the present system the consumer can't identify these physicians as more efficient. But in the Gold Cross plan, the consumer will be able to see the premium and know whether this set of doctors is more efficient. The Gold Cross plan does not ask its doctors to be at risk or give up their offices. It asks them simply to continue doing what they are already doing so well, and pays them fee-for-service on whatever basis is mutually agreeable to all participating providers. It also signs up some efficient hospitals. If the organizing physicians have done a good job of selecting attractive, efficient providers. then they can say to consumers, "if you join our Gold Cross plan and you go to the providers on our list, because they are efficient your premium will be less than if you join Blue Cross." Thus this has created an effective market system of choice and competition among providers over premiums and benefits. It can accommodate most existing

professional arrangements with minimal modification.

Two common questions asked by physicians are: (1) Do we have to go this far; won't this put groups of physicians at each other's throats?, and (2) Won't providers in these plans skimp on quality to keep their premium competitive?

In regard to the first question, both theory and experience make me skeptical that anything less will do the job. Choice and competition are proven incentives. I have not seen physicians get really tough on inefficient peers and hospitals except under the pressure of healthy competition. I have seen foundation plans take steps with wastrel colleagues and hospitals that they never would have taken under conventional medical society peer review procedures. The health care plan data system provides information on peer performance almost impossible to set up or obtain otherwise, and competitive pressure supplies the motivation for corrective action. Voluntary action through conventional peer review seldom motivates necessary action, and the whole thing smacks too much of a cartel for government to leave it alone. Thus voluntary medical society efforts, especially if ineffective, are prone to increasing regulatory intervention and oversight, as the history of PSRO demonstrates.

Regarding the possibility of delivery plan physicians skimping on quality, I think some might. Some physicians are deliberately over-serving under fee-for-service — a practice as dangerous as underservice — but I do not indict fee-for-service because of this; the great majority of fee-for-service physicians are highly conscientious. You can't condemn either fee for service or health care plans for the actions of a few unscrupulous professionals. I think most physicians would leave a health care plan that deliberately underserved. And eventually consumers will get wind of under-service and leave a plan of dubious reputation. Physicians who deliberately underserve or overserve should be weeded out of both systems.

On the other hand, I do not equate quantity with quality. Physicians who avoid marginal tests, unnecessary admissions, and unproven procedures, and otherwise practice conservative, low-style medicine within the bounds of good medical judgment can be as much or more effective than their high-style colleagues. Referring specialty services to a central tertiary center rather than having them at a plan hospital is not denying quality, it is simply efficient practice. In short, most physicians want to practice high quality medicine. In the absence of cost-effective incentives, most do so wastefully, as in the present system. In a health care plan, most will do so more cost-effectively.

To maintain good competition and avoid possible collusion, it is important that there be a diversity of health care plans. If one is physician-run and one is consumer run, it is hard to believe that they are going to collude on anything. Similarly, non-profit plans and for-profit plans should find collusion difficult, because they come from such different places. Likewise, group practice plans and solo practice plans, or salaried plans and fee-for-service reimbursed plans. Competition should be good. So diversity is extremely important. It is also extremely important that there be ease of entry into the market, so that new plans can start without great barriers. The threat of new plans coming in will help keep existing plans efficient and everyone trying to satisfy the consumer.

So we need to create a lot of these new plans, and that's going to be tough. It's going to take time to get that all going. I don't see that we can do it in less than three to five years if we worked full out starting today. It will take even more time for the new plans to begin impacting traditional providers.

The first response of traditional providers to a world of competing health care plans will be to ignore them and continue to do what they do now. As plans grow and the base of patients for traditional providers declines, such providers will try to maintain desired income by raising their prices and their service rates to the remaining patients. Eventually that will force up the insurance premiums of traditional providers faster than for efficient health care plans, and you will get an accelerating shift of consumers into these plans.

As health care plans become common, a number of shifts should occur. First, there will be a gradual shift in specialty mix. Efficient health care plans maintain a physician to population ratio (adjusted to a typical rather than employed population) of about 1.3 physicians per 1000 enrollees, about 60% of whom are in primary specialties. This compares with the present U.S. ratio of 1.8 physicians per 1000 population with about 40% in primary specialties. Primary doctors will find themselves in demand, and their status, income and number should increase commensurately. Specialists, especially those specialties with surpluses, will find their practice opportunities shrinking with the declining base of traditional patients. They will have to move, change specialties, or face decreased income, until their number is more appropriate.

Second, hospitalization and hospital capacity should decline. Efficient health care plans use less than 800

hospital days and 2.6 beds per 1000 population (adjusted for a typical rather than employed population). The comparable U.S. average is 1200 days and 4.5 beds per 1000 population. Hospitals not participating in health care plans will eventually find their use shrinking to the point where they will have to consolidate or go out of business. (Efficient plans will also tend to refer very specialized services to a few outside, efficient regional tertiary centers.)

I point out these effects to suggest that this approach can potentially handle very difficult issues which are presently objectives of public policy. And it can handle them in the private sector in an evolutionary way under the steady pressure of effective market forces. Little public intervention and regulation would be necessary.

That's the market model that I think has the most promise, but it will be extremely difficult to bring off. We will not do it unless we have real support and endorsement from medicine. We will also need the support of business and of labor. People will have to agree this is what we want to do.

Piecemeal Public Utility

Okay, suppose we do not get either market model. What regulatory model might work? There are two regulatory models that bear discussion. The first one, I am sure, will not work. I call it the "Omnibus Tinkering Piecemeal Public Utility Approach" to medical care. It is the one we are drifting into now. You take each piece of the cost equation, and you clap an independent regulatory program on it. So we have state rate review, Medicare utilization review, HSAs to review whether we need certain facilities, PSRO for review of appropriate use, and so forth. Bills are now in the hopper to restrict manpower production and to require doctors to practice some years in certain places once they get their degree. There is an increasing array of such piecemeal controls, each trying to control some portion of the expenditure equation, all unlikely to work.

First of all, it is extremely difficult to get your various bureaucrats to talk to each other. And so you get very uncoordinated actions. If you, a provider, try to satisfy one agency, then you offend another. For example, the state says you must have holes in the fire doors, but the feds say you can't have holes in the fire doors. Or is it the other way around? One agency says account your budget this way, another says account it that way. But beyond coordination there are even more fundamental problems. First, piecemeal regulation will not contain costs because the medical care system with its expansionary incentives will distort to find the cracks between the regulatory pieces and expand in all the unregulated areas. We have a whole Europe full of these piecemeal controls and distortions. Fees in some European countries are kept ridiculously low. So the system beats it by generating fifty thousand two-minute office visits, and so on. Each piece of regulation will temporarily restrain the cost rise, but then the system will figure it out and costs will start up again. There are five thousand of you for every one of me, so I have confidence you will beat me. (You're probably paid more, too, so you can afford to hire smarter people.)

Perhaps the biggest flaw in this approach is that the appropriate price of services, the appropriate quantity of services, the appropriate mix of services, is finally a medical decision. And so I have an impossible choice if I am trying to regulate this way. Either I turn these decisions over to bureaucrats, who have no professional competence to decide such things, or I turn it over to physicians, which is a bit like putting the fox in charge of the hen house. Not only your self-interest as physicians, but your professional interest puts you in an impossible conflict of interest situation.

Lid-oriented Public Utility

If we are going to control expenditures by a public utility, let us at least try to do it right. To do it right, we must shift over to the other side of the cost equation, to total expenditures. The public utility approach most likely to work would put a lid on total expenditures and gear all regulatory controls to keep the system within that lid. This is the way we buy education in this country. It is the way we buy defense. It is the way England buys medical care. The British first decide how much they are willing to spend for medical care, and they give it to the providers and they say here it is, do the best that you can for that, there is no more. There is a fair amount of evidence from England and from public education here that this lid-type of public utility approach can make expenditures controllable. There are a lot of reasons to believe we might not always make wise decisions on what the budgetary lid should be; we might under-invest or over-invest. But at least we will be able to make the decision. In the present system we can't decide; the medical care system now does whatever it will, and we run after it shoveling out the money.

The lid approach, while it could contain expenditures, will likely suffer from all the defects of any public monopoly. We are now beginning to develop theories of regulatory failure as sophisticated as our

theories of market failure. We know that certain conditions have to be met in order to have an effective working market. We are also beginning to learn that there are certain conditions that have to be met if government is going to be effective at what it does. I would refer to every thinking person in this room an article that summarizes the theory of regulatory failure. It's by Charles Schultze in the May, 1977, issue of *Harper's* called the *Public Use of the Private Interest*. It says heretofore when we had a problem in the private sector, we attempted to clap a public regulatory "command and control" structure on it. It used to be sufficient to show how the private sector was failing and then to recommend turning the problem over to government on the implicit assumption that government will do better. We now are finding out that under rather predictable conditions government may do worse. It is no longer enough to show the market is failing, you must also show that you can expect government to do a better job.

Let me suggest some potential pitfalls that research has identified in a public regulatory approach. The first pitfall is that government responds to strong producer interests, whereas markets respond to broad consumer interests. Individual consumers do not have the interest, time or money to make their views known to regulatory bodies, whereas producers cannot afford not to. A second pitfall is that it is difficult for government to delegate much latitude for judgment to civil servants, because errors in judgment will not stand up well in the political limelight or in courts of law. Therefore government is forced to substitute for judgment a set of administrative rules, procedures, requirements, and due process that we must go through. Now the rules and procedures must be simple and explicit enough that they can be administered by a set of average civil servants, yet they must apply everywhere. There is no set of simple rules that will apply equally in rural areas and suburbs and inner cities. And so inevitably these requirements will be akin to weeding your lawn with a bulldozer. For one example, government usually is forced to equate equity, which is a judgmental thing, with uniformity, which is not. In a market you like Ford, I like Chevy; in a public utility we'll get a Fordalet, and that's all that will be available.

Conclusions and Recommendations

So there are problems with regulatory failure that are perhaps as strong as the problems with market failure, and we have got to ask ourselves which of these imperfect models or what combination of them do we want for our future medical care system that might be better than what we have today. We can set ourselves up as a council of perfection and say: "Oh, this market approach won't work" or "oh, this regulatory model won't work." But I assure you if we do nothing because our council of perfection declares that all models are imperfect, we will drift into an ever more imperfect world of piecemeal regulation, because government is going to act now. Even if it is ineffective, they will have to show that they are doing something about runaway cost.

If physicians wish to have a voice in how the nation solves these problems, you will have to get behind a credible solution. I have given you my thoughts on what the credible alternatives are: Either a restructured private system with many health care plans competing with each other and traditional providers. Or a "lidded" public utility system in which regulators control rates, capital and entry (of manpower and facilities) to stay within a specified budget. I am skeptical that anything less will work simply because the structure and incentives will not be powerful enough to do the job.

Realistically, physicians will probably find that government will continue to pursue the regulatory course to some extent, even if providers propose a credible market approach. If the market approach doesn't happen or doesn't work, there will be no recourse but to strong regulation. The private sector will have to take the lead to make a market approach happen. But providers have been busy taking care of patients, and have largely ignored these larger policy issues. So they do not have a history that gives government leaders confidence that the private sector can and will do the job. So government will want some kind of back-up regulatory approach going. Nevertheless, if after a few years the private sector demonstrates that the restructured market approach has momentum and looks like it is working, then government interest and emphasis on further regulation should wane. Government does not enjoy being in an area where hard, unpopular trade-offs must be made. It has been forced into it by the intolerable cost rise. If the private sector can slow the cost rise by itself, I think government will be happy to step aside.

If we are to pursue a market approach and regulatory approach simultaneously, then we ought at least to make the regulation supportive of the market. Present regulation inhibits innovative market approaches. The regulatory sun shines equally, perhaps even harder, on the efficient than on the inefficient. One way to make regulation more supportive would be to exempt

health care plans from cost controls. As long as the plan is a serious effort and not a facade for business as usual, the competitive economic pressure and incentives on it make cost control regulation superfluous. Giving health care plans an exemption would reward innovative providers by getting regulation off their backs. It would give the private system, maximum opportunity and incentive to do the job themselves. Planning agencies should give just as much emphasis to making the market approach work as they give to regulating the system.

I highly recommend to physicians that you give the restructured market approach your best shot. If you can make it work, then further regulation will be unnecessary. If you don't like it, or if the American people won't buy it, then of course there will be no other course but strong regulation. But even if the market approach proves insufficient by itself to contain costs, to the degree that you have some market forces working, the regulation can be that much more minimal. On the other hand, if we go to the regulatory route first, and we don't like it, we can't resort to the market. There is little history of deregulation. It is very hard to dismantle or reorient regulation once in place.

There are several things physicians should do to implement a restructured market approach. First, organized medicine must endorse the concept and promote it. State and county medical societies must actively espouse a private pluralistic system which includes a diversity of health care plans as well as traditional practitioners. You must discourage overt and covert opposition to new competitive plans — discourage such things as denial of hospital privileges or professional ostracism of participating physicians. You must publicize the concept so that all physicians understand what it is and why it is desirable, so that consumers see good new plans as acceptable. You need to encourage leading physicians to participate in such plans, so that the idea acquires stature and reputation. Don't leave it to the marginal members of medicine.

Secondly, you will have to promote the idea very actively to business and labor, too, because it is these people who can open the market for new plans to employees. Business and labor have the market, and they will have to be convinced that this is a good deal. I think they can be convinced because I think giving people their choice is something both labor and business would approve of. You would also benefit from the help of business to get management expertise and the capital required to get a new plan underway. I think that you will find them interested, because the cost problem is also being particularly felt by business and labor; and I am sure business will be sympathetic to avoid this $180 billion industry slipping over onto the federal payroll.

Every doctor does not have to go out and join one of these plans to get this approach going. But every physician who is interested should explore the possibility actively. And those who don't want to do it should tolerate, if not support, their colleagues who do. I think that's about the message. Thank you very much.

Continuing Medical Information
Workshop for Children with Multiple Handicaps

Kahler Hotel, Rochester, Minnesota
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Day-long program with lecture and panels covering motor disorders, myelodysplasia, cardiac problems, orthopedic problems, as well as speech difficulties. Guest speaker is Dr. Alfred Healy, Medical Director, Crippled Children's Hospital, University of Iowa, Iowa City.

Sponsored by The Minnesota Department of Health, Crippled Children Division, University of Minnesota and Mayo Foundation, and Mayo Clinic, Rochester Minnesota.

Fee: to be announced Contact: Donald J. Erickson, M.D., Department of Physical Medicine, and Rehabilitation, Mayo Clinic, Rochester or Mr. William Nietz, Section of Communications, Mayo Clinic, Rochester, Minnesota 55901.

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Q and A — CME

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MMA Committee on Medical Education
Suite 900
101 East 5th Street
St. Paul, MN 55101

Those answered in MINNESOTA MEDICINE are the most common or the most appropriate to a specific time. Queries from individuals will be answered as rapidly as possible only if a self-addressed stamped envelope is enclosed.

Q. May accredited organizations certify various types of educational activities?

A. Yes. For example, an accredited organization may use the certification statement for a sponsored or co-sponsored planned program of learning such as audio-visual course or home study course. Similarly, the organization may use the statement for a Category II program (one that does not fulfill the stricter criteria for Category I).

Q. I haven't heard yet from the Board regarding its CME requirements for licensure renewal. How come?

A. As soon as possible after publication of the rule in the State Register, the Board will contact each physician registered to practice medicine in Minnesota. Currently, the date for mailing this information is approximately March 10, 1978. Physicians should be alert for the mailing and should review all enclosures carefully.

MINNESOTA MEDICINE *will continue to publish questions and their answers as an aid to Minnesota physicians. Remember, the first reporting year is 1978!*

Q. How can I get the Minnesota State Board of Medical Examiners to approve my group's program for MSBME Category I?

A. The MSBME rules, heard at public hearing, state, in part, that "any course planned, sponsored or co-sponsored by a medical or osteopathic medical school, state or national medical or osteopathic association, or a national specialty board shall be presumed to meet the above standards" (for MSBME Category I). Thus, the programs offered by LCCME accredited organizations (such as the medical schools, Duluth, Rochester, Minneapolis, Minnesota Medical Association and several Minnesota hospitals) and programs offered by regularly meeting Minnesota Societies and Specialty Societies are presumed to meet the criteria. The Board may withdraw this presumption if standards are not sufficient. MMA contemplates it will assist the Board if inquires sent to it concerning individual program approval will include accrediting statements from the Academy of Family Physicians, Minnesota Medical Association or a LCCME sponsor or co-sponsor.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

Minnesota Medical Association

Annual Meeting
Duluth — May 10-12
Clinical Medicine Explored
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MAY 11, THURSDAY
Morning Courses 8:00-11:00

Recent Advances in Respiratory Disease — 3 Credit Hours

A course planned to acquaint physicians interested in pulmonary disease on either a primary treatment or consulting level with recent advances in the diagnosis and management of two common respiratory problems: chronic obstructive lung disease and the interstitial lung diseases. Sponsor: Northlands Regional Chapter, American College of Chest Physicians.

Frank J. Indihar, M.D., St. Paul, Course Director
Paul R. Hamann, M.D., Minneapolis
Raymond R. Bonnabeau, M.D., St. Paul
Douglas B. Ketcham, M.D., St. Paul

Evaluation and Management of the Hypertensive Patient — 3 Credit Hours

Hypertension is a problem commonly encountered by the practicing physician. Demonstrations of therapeutic efficacy in this disorder have created new priorities in this area. The needs of recognizing, properly managing, and following the large numbers of hypertensive patients have assumed major importance in recent years. This postgraduate course is designed for the practicing physician. Understanding the basic pathophysiological mechanisms of hypertension, establishing the diagnosis and severity of hypertension, assessing the need for treatment, proper treatment using both pharmacologic and non-pharmacologic means, and criteria for excluding causes of secondary hypertension will be emphasized. A panel discussion will provide an opportunity for the registrants to address questions to the faculty. Physicians completing the course should be well prepared to thoroughly understand the hypertensive disease process and to effectively evaluate hypertensive patients, properly use available diagnostic modalities, and optimally manage their patients with hypertension. Sponsor: Minnesota Society of Internal Medicine.

Joseph A. Franciosa, M.D., Minneapolis, Course Director
John W. McBride, M.D., St. Paul
David F. Mohrman, Ph.D., Duluth
Sheldon G. Sheps, M.D., Rochester
Geza Simon, M.D., Minneapolis

Evaluation and Treatment of Neurological Problems — 3 Credit Hours

The evaluation and treatment of headaches, seizures, coma, TIA and parkinsonism by the family practitioner will be discussed in five lectures. Identification of major neurological diseases, indications for referral to a specialist and emergency treatment will be emphasized. Sponsor: Minnesota Society of Neurological Sciences.

Jasper Daube, M.D., Rochester, Course Director
J. Keith Campbell, M.D., Rochester
Ronald Cranford, M.D., Minneapolis
Bruce Snyder, M.D., St. Paul
Arthur Klassen, M.D., Minneapolis
Manfred Muenter, M.D., Rochester

MAY 11, THURSDAY
Afternoon Courses 2:00-5:00

Psychotropic Drugs — 3 Credit Hours

A program for the primary care physician concentrating on two topics for presentation and discussion: (1) Cross-physical and cross-psychological tolerance between psychoactive drugs, hypnotics and sedatives (including alcohol); (2) Out-patient treatment with anti-psychotics. Sponsor: Subcommittee on Alcoholism and Other Chemical Dependencies.

Faruk S. Abuzzahab, Sr., M.D., Ph.D., Minneapolis, Course Director
James Cumming, M.D., Ph.D., Minneapolis

Evaluation and Treatment of Neurological Problems (Repeat Program) — 3 Credit Hours

Diagnosis & Therapy of Common Skin Conditions — 3 Credit Hours

This course is designed for physicians in primary medical practice. Emphasis is placed on diagnosis and therapy of dermatologic problems that are currently common. The presentations will utilize 35mm slides, lectures, mini-case presentations and group discussions. Ample time will be allowed for questions and discussions with a panel. Emphasis will be placed upon the management of acne, contact dermatitis, warts, psoriasis, and scabies. Sponsor: Minnesota Dermatologic Society.

Milton Orkin, M.D., Minneapolis, Course Director
Mark V. Dahl, M.D., Minneapolis
Roy S. Rogers, M.D., Rochester
Franklin Pass, M.D., Minneapolis
Thomas T. Myers, III, M.D., Duluth

All Day Courses 8:00-11:00/Break/2:00-5:00

Recent Advances in Clinical Medicine: A Practical Update for ALL Physicians — 6 Credit Hours

Six 1-hour presentations, including a question and answer period, reviewing six areas of clinical medicine of interest to all physicians whatever their specialty may be. This program is designed to bring all physicians to a greater understanding of problems co-existent throughout all specialties and allow them to increase their knowledge in all areas. The firm objective of this course is that all participants will have their knowledge considerably improved in six major clinical areas: Allergy — Diagnostic & Therapeutic Advances, Rheumatology — New Diagnostic Tests & New Drugs, Pharmacology — Drug Interactions & Common Errors, Ultrasonography in Clinical Diagnosis, Treatment of the Untreatable Patient — Patient/Physician Viewpoints on Death, the Patient on a Fad Diet. Sponsor: Minnesota Academy of Family Physicians.

C. Paul Martin, M.D., Marshall, Course Director
Stephen C. Weisberg, M.D., Minneapolis
Richard B. Tompkins, M.D., Rochester
Barry Handwerger, M.D., Minneapolis
John Brantner, Ph.D., Minneapolis
Donald B. Hunninghake, M.D., Minneapolis
Ronald P. Seningen, M.D., Minneapolis
Pat Palumbo, M.D., Rochester

Interpretation of Laboratory Data — 6 Credit Hours

This exercise in interpretation will be oriented toward assisting the practicing physician to integrate disparate laboratory data from many subdivisions of the clinical laboratory and derive the most likely diagnosis. It will also address logical sequences of test ordering and the elimination of redundancies in test batteries. The format will be centered around the mini-CPC. A variety of micro-case histories with lab data will be distributed to participants. These cases will be used to stimulate group discussion (rather than formal lecture) and will

MAY 11, THURSDAY
All Day Courses 8:00-11:00/Break/2:00-5:00 (Continued)

cut across a number of subdisciplines (hematology, chemical screening profiles, electrolytes and acid-base, enzymology and endocrinology). In bringing all the relevant data together, the faculty will attempt to derive for participants a reasonable approach to test ordering and focus on the major diagnostic possibilities when all the laboratory data have been considered. Test results will be illustrated by 35mm transparencies and extensively referenced. Sponsor: Minnesota Society of Clinical Pathologists.

Patrick C. J. Ward, M.D., Minneapolis, Course Director
M. Desmond Burke, M.D., Minneapolis

Basic Cardiac Life Support Certification — 6 Credit Hours

The Course will begin with a plenary session reviewing the updated STANDARDS OF CARDIOPULMONARY RESUSCITATION (CPR) AND EMERGENCY CARDIAC CARE (ECC) in Basic and Advanced Cardiac Life Support. Didactic presentations in Advanced Cardiac Life Support will briefly discuss life-threatening dysrhythmias, defibrillation, and essential drug therapy in emergency cardiac care.

A Basic Cardiac Life Support (BCLS) Rescuer Course will follow. BCLS includes the following four areas: unwitnessed cardiac arrest, witnessed cardiac arrest, opening an obstructed airway, infant resuscitation. Initial Basic Rescuer certification is based on a passing grade on the cognitive test and perfection in the performance examination for an unwitnessed cardiac arrest in an adult. If time permits, participants may also take the performance examinations for witnessed cardiac arrest, opening an obstructed airway and infant resuscitation. Participants will have an opportunity for manikin practice prior to the actual certification performance. Attendance will be limited.

Since certification is based on both a passing grade on the cognitive test and a perfect score on the performance examination, registrants for this course should recognize that preparation will be necessary prior to the actual session. A packet of information will be mailed to course registrants 30 days in advance. Sponsor: Duluth Division — American Heart Association, Minnesota Affiliate.

Milton Cox, M.D., Duluth, Course Director

MAY 12, FRIDAY
Morning Courses 8:00-11:00

Soft Tissue Injuries and Soft Tissue Disease — 3 Credit Hours

A course discussing soft tissue injuries and disease surrounding the bones and joints. Diagnosis and treatment of tendon ruptures, tennis elbow, back injuries and rheumatoid arthritis. Sponsor: Minnesota State Orthopedic Society.

Lyle O. Johnson, M.D., St. Paul,
Edward H. Kelly, M.D., St. Paul, Course Directors

Office Radiography: Taking Good Film Safely — 3 Credit Hours

This is a basic course designed for the non-radiologist. It will address the following elements: x-ray machines and other equipment; protection of patient and operator; radiation exposure; positioning; developing; government regulations, standards and inspections; and, overall quality assurance of radiograph. Instruction will utilize lectures, slides and a detailed well referenced syllabus. The participant will acquire an increased knowledge of quality radiography; skills to minimize radiation exposure; and a greater appreciation of the physician's responsibility in radiography. Sponsor: Minnesota Academy of Family Physicians.

John Smith, M.D., Minneapolis, Course Director
John Coleman, M.D., St. Paul, Course Director
Roxanne Thomas, B.S., R.T., St. Paul

MAY 12-FRIDAY
Afternoon Course 2:00-5:00

Dizziness — A Panel Discussion — 3 Credit Hours

This course will present a panel of specialists dealing with the topic of vertigo. The physician who takes this course will be better versed in the multidisciplined approach to the dizzy patient and have an understanding of the diagnosis and treatment. Sponsor: Minnesota Academy of Ophthalmology and Otolaryngology.

Melvin E. Sigel, M.D., Minneapolis, Course Director
A. B. Baker, M.D., Ph.D., Minneapolis
H. M. Paisner, M.D., Minneapolis
Robert A. Van Tassel, M.D., Minneapolis

All Day Courses 8:00-11:00/Break/2:00-5:00

Electrocardiography — 6 Credit Hours

During the past decade new concepts have emerged in the field of electrocardiography which, when properly utilized, can improve our level of patient care. The purpose of this course is to enable the practicing physician to utilize these newer concepts of electrocardiography as well as to reinforce the utilization of previously learned basic concepts so that the physician may improve the effectiveness and efficiency of patient care. The course will begin with a review of the basic concepts of the normal electrocardiogram and normal variants and then proceed through a discussion of the conduction system including blocks in the atrioventricular junction and bundle branches (the "hemiblocks"). Supraventricular and ventricular arrhythmias will be covered in depth. Recognition and localization of acute myocardial infarction patterns will be discussed, as well as other electrocardiographic patterns which may simulate a myocardial infarction. The course will conclude with the discussion of ambulatory electrocardiographic monitoring and exercise stress testing which will enable the practicing physician to appropriately select such examination for particular patients. Sponsor: Minnesota Society of Internal Medicine.

Fredarick Gobel, M.D., Minneapolis, Course Director
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Surgical Management of the Hemorrhaging Patient — 6 Credit Hours

This program is designed not only for the surgeon but primary physicians as well, to familiarize them with the many different presentations of massive hemorrhage, pre-operative evaluation in terms of coagulation disorders, gastro-intestinal hemorrhage, pelvic trauma and epistaxis. Sponsor: Minnesota Chapter, American College of Surgeons

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The Recognition and Care of the High Risk Pregnant Patient and Neonate — 6 Credit Hours

The educational objective of this 6-hour course is to further enlighten those physicians involved with obstetrics and newborn care relative to the management of the high-risk

MAY 12, FRIDAY
All Day Courses 8:00-11:00/Break/2:00-5:00 (Continued)

pregnant patient and the distressed neonate. The course will be divided into two parts. The obstetric aspect will include the identification of the truly high-risk patient, the clinical and newer laboratory modalities available for the critical assessment of the pregnancy, and the intrapartum management of the high-risk situation. The neonatal section will outline the care of the asphyxiated neonate, the early recognition of the more subtle problem neonates, and considerations for stabilization of the sick neonate and transport when necessary. Sponsor: Minnesota Obstetrical & Gynecological Society and Minnesota Chapter, American Academy of Pediatrics.

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Scientific Assembly

Members of the St. Louis County and Range Medical Societies cordially invite you to attend the 1978 Minnesota Medical Association Annual Meeting, May 10-11-12. Duluth is the meeting site. It offers new opportunities, both for the meeting and weekend activities with family and friends. An added bonus for fishermen: Minnesota's season opens May 13.

The scientific program information in this issue speaks for itself. CME '78 is definitely worth your time.

Many other Annual Meeting activities also merit your attention. Wednesday, May 10: MMA House of Delegates & Reference Committees, Golf & Tennis Tournaments, Committee Meetings, Exhibits, and the ANNUAL MEETING RECEPTION.

Exhibits open on Wednesday evening with complimentary hors d'oeuvres and a cash bar available in the Duluth Arena from 7-9 pm. Plan to arrive in time to attend this new event. A skywalk connects the new Normandy Inn Duluth to the Arena/Auditorium complex, so you don't even need to go outdoors from hotel to exhibit hall.

Thursday May 11: Annual Meeting Luncheon, President's Reception and Annual Banquet, Committee Breakfasts, Exhibits, MINNPAC Annual Meeting, MMA Auxiliary Activities.

Guest speaker for our luncheon is Dr. Lynn Rogers, wildlife ecologist whose research on Minnesota's black bear population has been covered by SPORTS ILLUSTRATED magazine, the AMERICAN SPORTSMAN television program, and local media. A poolside reception in the Normandy Inn will honor our MMA President. Dr. and Mrs. Chester Anderson will be there to greet everyone. Their guests include MMA officers and trustees, Dr. Frank Jirka, Vice Chairman of the AMA Board of Trustees, 1978 members of the Fifty Club, MMA members receiving awards for their service, and the many members and their spouses who attend to enjoy this social highlight of each MMA Annual Meeting. Special entertainment by the Mod Minstrels from the College of St. Scholastica is planned.

Friday May 12: MMA House of Delegates, Exhibits, MMA Auxiliary Activities, Board of Directors — MN State Orthopaedic Society, MN Chapter American College of Surgeons, MN Chapter American College of Emergency Physicians, MN Academy of O & O.

MMA members received details and registration materials in the mail. Register in advance, and plan to arrive on Wednesday so you can enjoy the entire meeting. Scientific program, business activities and social events are all planned for you. . . . We want to see you in Duluth.

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1978 MINNESOTA MEDICAL ASSOCIATION ANNUAL MEETING REGISTRATION

REGISTRATION FEE: $25 FOR MMA MEMBERS
$50 FOR NON-MEMBERS
EXEMPT - RESIDENTS AND MEDICAL STUDENTS

Please make check payable to Minnesota Medical Association.

The scientific program is comprised of fourteen courses. When registering, please pay attention to the time element of each course. On each day, you have a choice of attending either a morning and afternoon course OR an all day course. Indicate, by number, your 1st, 2nd and 3rd choices for EACH TIME PERIOD. You will receive notification if your choices are unavailable. NO ADVANCE REGISTRATION CAN BE ACCEPTED AFTER May 1.

Please pick up your registration materials at the registration desk in the Duluth Arena-Auditorium.

CLINICAL MEDICINE EXPLORED May 11-12, 1978

Thursday, May 11

Morning Courses 8:00-11:00

A. _____ RECENT ADVANCES IN RESPIRATORY DISEASE

B. _____ EVALUATION AND MANAGEMENT OF THE HYPERTENSIVE PATIENT

C. _____ EVALUATION AND TREATMENT OF NEUROLOGICAL PROBLEMS

Afternoon Courses 2:00-5:00

D. _____ PSYCHOTROPIC DRUGS

E. _____ EVALUATION AND TREATMENT OF NEUROLOGICAL PROBLEMS (repeat)

F. _____ DIAGNOSIS AND THERAPY OF COMMON SKIN CONDITIONS

All Day Courses 8:00-11:00 A.M. - BREAK - 2:00 - 5:00 P.M.

G. _____ RECENT ADVANCES IN CLINICAL MEDICINE; A PRACTICAL UPDATE FOR ALL PHYSICIANS

H. _____ INTERPRETATION OF LABORATORY DATA

I. _____ BASIC CARDIAC LIFE SUPPORT CERTIFICATION

Friday, May 12

Morning Courses 8:00-11:00

J. _____ SOFT TISSUE INJURIES AND SOFT TISSUE DISEASE

K. _____ OFFICE RADIOGRAPHY: TAKING GOOD FILM SAFELY

Afternoon Course 2:00 - 5:00

L. _____ DIZZINESS -- A PANEL DISCUSSION

All Day Courses 8:00-11:00 A.M. - BREAK - 2:00-5:00 P.M.

M. _____ ELECTROCARDIOGRAPHY

N. _____ SURGICAL MANAGEMENT OF THE HEMORRHAGING PATIENT

O. _____ THE RECOGNITION AND CARE OF THE HIGH RISK PREGNANT PATIENT AND NEONATE

CUT HERE

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Please indicate first and second choice of hotel by number. Check off type of accommodation desired.

NORMANDY INN _____ single, $26.50 _____ double, $31.50 _____ poolside single, $29.50 _____ poolside double, $34.50

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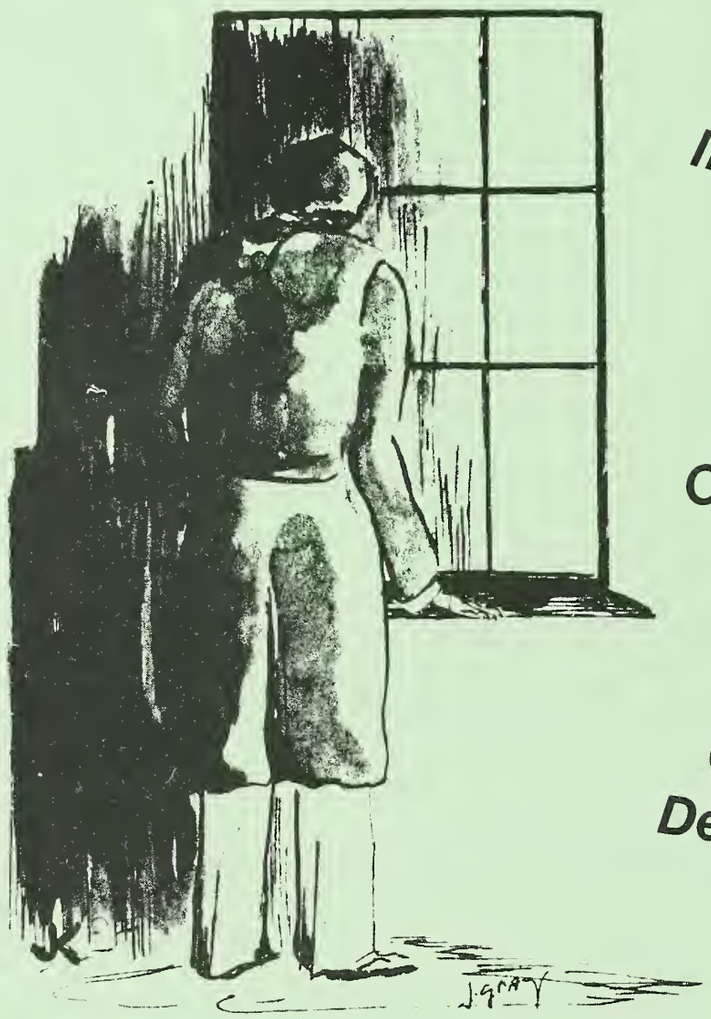
DEPARTURE: Date _____ Time _____

You will receive a confirmation directly from the hotel. Rooms are held until 6 P.M. unless request for late arrival. Please do not include the payment of your reservation with this form!

MMA requests authorization to release information of your attendance during this meeting: Yes ____ No ____

Detach this form and send to MINNESOTA MEDICAL ASSOCIATION - '78 Annual Meeting - 101 E. 5th Street #900
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CONFIDENTIAL, CONCERNED ADVOCACY

(Continued from page 258)

OB-GYN, ANESTHESIOLOGIST and Orthopedic Surgeon to join progressive incorporated seven man group in Central Minnesota. 120 bed hospital. Lake area. Excellent leisure activities. Starting salary $40,000 per year. Contact Personnel Director, Little Falls Clinic, Little Falls, Minnesota. Telephone 612/632-3611.

PSYCHIATRIC RESIDENCY: Vacancies for (PG2 through PG4 only) positions for July 1, 1978 for those who have a regular Iowa license or can obtain one by reciprocity or via FLEX. Prepare for career in private practice, community clinics or hospital based psychiatry. Emphasis on close supervision of intensive individual and group psychotherapy, OPD, Children's Unit, Adolescent Unit. Neurology affiliation with University of Iowa. The stipends are: 1st year, $22,360; 2nd year, $23,478; 3rd year $24,674. Intensity and diversity of training program appreciated best by personal visit. T. B. McManus, M.D., Superintendent, Mental Health Institute, Cherokee, Iowa 51012. Equal Opportunity Employer. Call collect 712-225-2594.

BOARD CERTIFIED. 32 year old family practitioner, seeking practice opportunity in small to medium-sized group in Minnesota or Wisconsin. Wife is pediatric nurse practitioner seeking work opportunity in same area. Available January 1979. Write: Minnesota Medicine — 534, 101 E. 5th Street, St. Paul 55101.

PHYSICIAN ASSISTANT: 26, married, grad. of Univ. of Nebr. Med. Center. Seeking employment in rural area with Family Practitioner. Available in May. Write Jay Pashalek, 115 N. 40th St., Omaha, Nebr. 68105 for resume.

PHYSICIANS AVAILABLE — Pediatrics (Minn.), Cardiology (T/C or Minn.), General Surgery (Minn.), Psychiatry (T/C), Internal Medicine — Oncology (T/C), OB-Gyn (T/C), Pathology (Minn.), Family Practice (T/C), Urology (Minn.) Family Practice (Minn.-Wisc.). This is a sampling of physicians seeking opportunities through the services of Metropolitan Medical Placement. If you are interested in adding an additional staff member, please contact Mr. Hultstrand or Mr. Holmes at (612) 831-5232.

APPLICATIONS WELCOMED from board-qualified or certified radiologists, large teaching hospital, upper Midwest; university affiliation, subspecialty training in pediatrics and/or therapy desirable. Box 529, MINNESOTA MEDICINE, 101 E. 5th St., St. Paul 55101.

FULL-TIME PHYSICIAN — Opening exists in AAL's Appleton, Wisconsin home office. Position includes providing medical counsel to life and health insurance claims and underwriting functions, and providing a prospective medicine program for home office and field employees. An attractive benefits program is available. Location offers family oriented mid-metro environment with exceptional education and recreation facilities. Apply in confidence to: Manager, Employment, Aid Association for Lutherans, 4321 North Ballard Road, Appleton, WI 54919.

MINNESOTA PHYSICIANS OUTSIDE METRO AREA — Social Security Disability Services is seeking specialists in the fields of psychiatry, orthopedics, neurology, and internal medicine to perform consultative examinations. These evaluations and reports would be similar to those requested by a colleague. Fees are on a usual and customary basis and our excellent teledictation service is available. For further information write or call Irene Pierson, Assistant Director, Medical Services; 460 Metro Square, St. Paul, MN 55101; (612) 296-4419.

APPLICATIONS WELCOMED from surgical assistants for a position with a 15 man multiple specialty primary care clinic in Southern Minnesota. Competitive salaries, good fringe benefits, and excellent working conditions. Write: Medicine Medicine-535, 101 E. 5th St., St. Paul 55101.

ENJOY FISHING? The Walleye Capitol of the world needs 2 Family Practitioners or General Practitioners for a family-oriented community of 1600 with a medical service population of 6000. Medicare certified hospital with a new clinic being planned. The Minnesota educated general surgeon here needs help. Salary with partnership option at 6 months. Outdoor recreation galore. Contact Trinity Hospital, Baudette, MN, 56623. Call collect (218)634-2120 for more information.

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ASSISTANT DIRECTOR FOR UNIVERSITY OF MINNESOTA AFFILIATED Family Practice Residency in Northern Minnesota. Time divided between practice, teaching and administration. Residency training preferred but not required. Salary and fringes negotiable. Send resume to: James Blackman, M.D., Acting Program Director, Duluth Family Practice Center, 330 North Eighth Avenue East, Duluth, MN 55805. The University of Minnesota is an equal opportunity affirmative action employer.

PRIMARY CARE PHYSICIANS desired to join a 2 physician practice in two community based clinics in Central Minnesota. 80 minutes from the metropolitan area. Salary 35-43,000 depending on qualifications. For further information contact James Lawson, Cold Spring Medical Clinic — 26 N. Red River Ave. Cold Spring, MN 56320.

PSYCHIATRIST. University of Minnesota, Minneapolis-St. Paul. Board certified or board eligible psychiatrist to work in the Boynton (student) Health Service outpatient mental health clinic. Practice modalities include individual, couple, group psycho-therapy, and crisis intervention. Nine month appointment, beginning September 16, 1978, plus option to work one five-week summer term. Generous fringe benefits. Salary negotiable and commensurate with training and experience. University of Minnesota is an Affirmative Action/ Equal Opportunity Employer. Send resume and three letters of reference by May 15, 1978 to: Mary H. Pennington, M.D., Boynton Health Service, 410 Church St. S.E., University of Minnesota, Minneapolis, Minnesota 55455 (telephone (612) 373-4022).

FOR SALE: Kent Binocular Microscope, Coaxial Drive. Eyepieces WF10X. Four objectives. Built in illuminator. With case. By third year medical student 218-784-1758.

FAMILY PRACTICE GROUP — A new physicians P.A. is seeking additional members for a group practice in suburban Ramsey County. This is an excellent opportunity to develop a primary care group practice in a growing suburban residential area. For more detailed information, contact Joy Kristine Anderson, M.D., Northeast Community Physicians Group, 559 Capitol Boulevard, St. Paul, Minnesota 55103, telephone 221-2355.

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Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude ataxia, oversedation, confusion (no more than 2 capsules/day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider pharmacology of agents, particularly potentiating drugs such as MAO inhibitors, phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions reported in psychiatric patients. Employ usual precautions in treating anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship not established.

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Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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President's Letter



It Has Been My Pleasure

I would be amiss in this last communication with you as your President if I did not express my appreciation to Dr. Richard Reece and Dr. Elaine Nye for the opportunity each month to express my personal opinions and feelings in the form of the President's Letter.

I must also say "thank you" to the excellent staff we have at the Minnesota Medical Association Office. They are all experts in their own field and completely dedicated to the principles and policies set up by your Board of Trustees.

It is customary for an outgoing President to list the accomplishments of his year in office, and this may be worthwhile. But it may be more conducive to progress if one would discuss with you some of the projects that have been started and hopefully will be carried out in the years ahead.

The April issue* carried some of my comments on an attempt to improve our communications with the public, the media, our patients, and our peers. Hopefully the program will improve from year to year and by so doing, help to insure your support of the many MMA programs.

A total effort at reorganizing our committee structure should begin to pay off in more efficient operations and better utilization of our staff people. Fewer, more active committees should be the result with greater use of ad hoc committees for special projects that will be self-limiting.

The entire socio-economic field has taken more and more of our resources, efforts, and time, and of necessity should be continued at the present level, perhaps even expanded. The legislative efforts this year were particularly gratifying, and the Certificate of Need vote in both the House and Senate demonstrated what could be done when there was a concerted effort by our lobbyists, our legislative committee members, and the many physicians who were legislative contacts. You are all to be congratulated in this effort, and it demonstrates what can be done with a true, all-out effort. This type of effort will have to be expanded on many issues in the future and should be carried out with the same enthusiasm.

Progress is being made in setting up physician task forces throughout the state to monitor and have input into the various HSA agencies that are becoming active under Public Law 93-641. This law set up the HSA agencies and will be the format for National Health Insurance unless we, as physicians, join in the effort to monitor and guide these HSAs. So, please, if you are asked, don't hesitate to be on one of these physician task forces. Your expertise is needed at all levels.

Continuing medical education has become a "must" for all of us, and our Committee on Medical Education and its sub-committees have done a yoeman's job in having input into the Board of Medical Examiner's Rules and Regulations for CME. We, all of us, realize that medicine is not a static profession, and we are duty obligated to keep up as best we can. Your MMA, through its Medical Education Committee, will continue to work for you in making it as painless as possible to acquire your CME credits.

Continued liaison with the Blues, DPW, and other third party payers has been the responsibility of your Medical Service Committee which is continually offering medical expertise to these various organizations. That committee is also occupied with data accumulation and what to do with the data once

*See page 202.

accumulated. A great deal of money and effort has been expended in an attempt to get better and less expensive coverage under professional liability. We think you will be pleased with some of the announcements that are forthcoming at the Annual Meeting.

Expansion of our membership has been a primary project of this, my year in office. While it is true that dues for county, state and AMA memberships are continuing to increase, it is also true that what these dollars are being spent for are all in behalf of programs that will benefit *all* of you.

As an example, the legislative effort has allowed you to practice pretty much with as much freedom as you did twenty years ago. This did not just happen. It was worked at. The Blues are covering most of the procedures you perform in your practice. It did not just happen. Your professional liability insurance premiums, though high, are still a great deal less than a number of other states. It did not just happen. The HSA activity in this state has had input by physicians literally since its inception, and as a result has been a great deal less regulatory than in a number of other states. It did not just happen. The insurance programs available to members only are excellent programs, allowing you to get life insurance and other forms of insurance at lower premiums than can be obtained any place else. It did not just happen.

A number of these benefits have been available to *all* physicians in the state, not just members. We would urge those who have been reaping the benefits without being members to accept their responsibility in the many efforts and become members.

We are most pleased with the activities of the Auxiliary through this last year. I, as well as a number of the members of the Board of Trustees, have felt that the Auxiliary is our right arm in a number of these programs, and they are proving to be such. Mrs. Gayle Whitesell and Mrs. Eleanore Halverson have been most cooperative in any tasks I have requested the Auxiliary to perform this last year. I have repeatedly urged them to monitor the HSA board meetings and legislative activities and to urge their husbands to get into the act. They have been most cooperative in this effort.

What's the future? No one has a crystal ball, but we can be sure government will put forth greater effort in an attempt to control our practices; costs will escalate; and we have to work diligently to keep these at a minimum. New methods of practice and new technology will always be forthcoming. Can we meet the challenge? I have no doubt that we have the greatest organization of physicians in any one of our fifty states and under the able leadership of your next year's president, Dr. Robert Flom, and a dedicated staff under the direction of Mr. Harold Brunn, is well equipped, and has the combined expertise to handle any and all challenges. I urge you to please accept the responsibility of doing *your* share. It has been a pleasure to serve you as your President, and I wish to thank you all for that honor.



C. A. Anderson, M.D.
President

Continuing Medical Education

Minnesota Obstetrical and Gynecological Society

The Minnesota Obstetrical and Gynecological Society Spring Meeting, June 8 to 10, 1978, Madden's Resort, Brainerd, Minnesota. Approved for AAFP 10 Prescribed Credit Hours and 12 ACOG Cognates. No registration fee. Roger D. Kempers, M.D., Mayo Clinic, Program Chairman.

Mayo Clinic

Mayo Clinic Course: "Current Medical, Surgical, and Physiologic Aspects of Rhinology," in cooperation with the American Rhinologic Society. June 1, 2, 3, 1978. For preregistration information contact: Clifford F. Lake, M.D. or Eugene B. Kern, M.D. Mayo Clinic, Rochester, Minnesota, 55901. Telephone: (507) 282-2511.

Editor's Notebook

Medicine and the Media

The media — television, newspapers, radio, and magazines — selects medical news for the public, interprets that news from the media's point of view, shapes the public's perception of medicine, and, in general, serves as the principle arbiter of social attitudes towards the medical profession. The media, in other words, controls the news the public receives about medicine.

Nature of Media

So what? After all, are not media people conscientious, well-educated, well-informed, and imbued with a sense of the public good? Of course they are. Besides, the media is not a homogenous monopoly. As Daniel Greenberg, a reporter who writes the "Medicine and Public Affairs" section in the *New England Journal of Medicine,* says: "Now, it must be noted that the American press is an extraordinarily diverse enterprise, ranging from rural weeklies to rich and internationally influential dailies — from the middle ground occupied by mass-selling gossip papers to drug investment tip sheets."[1] Surely such a diverse group would not conspire to undermine public confidence in the medical profession and the health care system.

News Selection and News Interpretation

The media may not conspire, but through the way it selects and interprets news, it feeds suspicions something is terribly and fundamentally wrong with the health care system. As a physician, you need to watch or listen or read only a few news releases to know the media has a negative bias towards the present means of providing health services.

Physicians' Attitudes

In general, this negative bias leads physicians to adopt one of three attitudes: (1) a skeptical suspicion that media representatives are explaining what they do not understand; (2) a paranoid feeling that the press and the government are colluding to sink the twin ships of free enterprise and fee-for-service medicine; and (3) a ho-hum apathy that says: "What the hell? No matter what physicians say or do, the media boys will continue to saturate television, newspapers, radios, and magazines with their one-sided interpretations and inaccuracies."

Futility of Attitudes

Even if these attitudes contain truths, they reflect an unhealthy state of affairs. The attitudes smack of paranoia, and they do not help our cause with the public. Complaining in private that the media mistreats us is futile. Instead, we must understand why the media reacts as it does and then correct its misconceptions with facts. If we feel strongly about our current system, we ought to be able to articulate our reasons and persuade enough of the public and the media to restore balance to the present distorted picture of Medicine.

Who are the Media?

Why do media people feel the way they do? To answer, you must understand who the media are. According to Peter Sandman, Ph. D., of the School of Natural Resources of the University of Michigan: "Journalists and scriptwriters are predominantly white, male, middle-class, urban, liberal people. Without especially trying to — often conscientiously trying not to — these people inevitably saturate the rest of the country with their particular sense of reality."

As conscientious liberals, media people sincerely believe the government can right most social wrongs through a combination of legislature, an egalitarian society, increased taxes with tax reform, and a centralized compassionate government that plays no favors in handing out social services.

But it is not only the media's political perspective that gives the news its flavor. It is also where the media people get their information — who and where their sources are. Journalists have a job to do, and they write what they find out about.

HEW As A Source of News

In Medicine and Health, the major source of front-page newspaper reports, evening TV newscasts, spot radio news, and major magazine articles is the government, particularly the Department of Health, Education and Welfare. HEW now consumes 36 percent of the Federal Budget, and its Director, Joseph Califano, has a direct pipeline to the media. Califano tells the media what he wants the American Public to hear, and reporters dutifully report what he proclaims to be true, e.g. that physicians who make over $100,000 from Medicare and Medicaid (according to erroneous computer lists) are unscrupulous, and, that a recent $4.5 billion HEW "loss" is due to physicians "ripping-off" HEW through fraud, abuse and unnecessary operations. Rarely does the media question Califano's pronouncements. Even more rarely does the media bother to indulge in any "investigative reporting" — to dig for the facts behind HEW's announcement. The media, in short, passively accepts officialdom's words as gospel.

What is Wrong?

What, if anything, is wrong with all of this?

In the first place, the media's perception of the public mood is out of step with the times. Attitude surveys of the American public clearly show the public's belief in government solutions to all problems is fading fast. In trying to do too many things for too many people, the government has failed to perform — has not provided social services commensurate with the tax bite.

Indeed if the 1970s are remembered for anything, they may well be remembered as the decade in which faith in a central government crested, then subsided. In 1974, Daniel Yankelovich's research surveys showed that 93 percent of Americans favored our free enterprise system.[3] Despite Carter's pledge to "restore faith in government", little evidence exists that the public's trust in government benevolence has grown since 1974.

Second, the media's constant message that a National Health Insurance Program is desirable and therefore "inevitable", and is only being held back by greedy physicians and uncooperative administrators and third-party officials, is not, in fact, true. The drive for National Health Insurance is losing steam. This is so for many reasons. These include: (1) 94 percent of the population is already covered by health insurance; (2) the public's confidence in the Medical profession is growing — by 13 percent in 1977 according to a Louis Harris poll; (3) a recent University of Chicago survey indicates that 88 percent of Americans are satisfied with their health care; (4) an October 1977 HEW survey conducted at 100 public hearings, which produced 8,600 written opinions from people and organizations, failed to detect any enthusiasm for National Health Insurance (In fact, most of the South and Midwest flatly opposed the idea); (5) Many things are "right" with

American Medicine (63 percent of people who visit physicians are satisfied with the bills; 64 percent can obtain a doctor's appointment in two days; 74 percent of blacks and poor Americans have improved access to doctor's services; 87 percent of infants and small children visited the physician at least once in 1976; infant mortality has dropped 19 percent the last five years; mortality from coronary artery disease has dropped 25 percent the last 14 years; and 52 percent of Americans got a physical examination in 1976)[7] and (6) the present economic climate — inflation, rising Social Security taxes, business distrust of the Carter Administration, and the pervasive tax revolt among the middle-class — make passage of a National Bill not "inevitable" but highly unlikely, now or in the near future.

Third, the media consistently fails to put matters of health care inflation in any sort of perspective. For example:

- When the media publishes news of the average physician's income, say $63,000, they fail to point out this sum does not include fringe benefits (which generally average 20 to 25 percent of income for most employed citizens) nor does the media compare the doctor's take home income to the typical media executive or business executive of comparable status.
- When the media decries the health care's growing portion of the GNP (now 8.6 percent), they do not say this percent of GNP is considerably greater in such countries as Canada, Belgium, Sweden, and most Western European democracies.
- When the media talks of health care inflation outrunning the general rate of inflation by 2½ times, they do not note that this inflation rate applies to most service industries — not just to Medicine — including the media itself. Nor does the media compare Health Care to other sectors of the economy. Consider these inflation figures for the last three years:[8]

Health Services	Up 41%
Food	40%
Legal	50%
Automobiles	46%
Magazines and Newspapers	62%

What Role for Medicine?

Given the current political and social scenario, what role should Medicine play? I believe, and have believe for a long time, that Medicine should argue the issues in media forums and media publications of ideas. What Medicine needs is a systematic, carefully-wrought, and factually-presented argument on the behalf of the profession on issues of the day. I am encouraged that the American Medical Association has announced it will undertake a national campaign to give a more positive image to medicine through a hard-hitting factual presentation of what's right with Medicine.

The media is critical in shaping public attitudes towards Medicine. Public attitudes will determine the future of Medicine. Until now, we have permitted the media to influence public attitude by default. We have not forcefully and openly argued the issues of public policy within the Media itself. Yet, this can be done, at least it has been done in the Business and Health sectors. With considerable success, the Mobil Company, the Aetna Insurance Companies, Travelers Insurance Company (whose motto is "Raising our voice, not just our rates") have come up with many-pronged national campaigns featuring well-written, pointed, issue oriented editorial advertisements. These editorials have featured factual barrages, and although they carried their own bias, the campaigns have caused shifts in editorial viewpoints — a hesitancy to present only the media's point of view.

What the media needs, and what Medicine should give them, are more facts and less rhetoric.

See the references on page 340.

Richard L Reece MD



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"I buy my suits at Hubert W. White. My father, who is age 74 shopped there when Bob White's grandfather owned the store. It's a part of my family. Right now I'm wearing a comfortable three piece natural shoulder suit by E & J Peake. To me, Hubert W. White is a high quality, conservative men's clothing store that caters to a repeating clientele rather than people just drifting through. I have a regular clothier and I want to be looked on in my life insurance business the same way."

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Treatment of Gastric Carcinoma

New Perspective

DAVID G. AMAMOO, M.D.;* WILLIAM H. ReMINE, M.D.;† and RICHARD G. HAHN, M.D.‡

The extent of an inoperable gastric carcinoma was found to be markedly decreased after treatment with cytotoxic chemotherapy. The lesion could be resected with free margins at a later date. Perhaps a routine combination of such a chemotherapeutic regimen in patients with advanced gastric cancer would increase the rate of resectability.

SURGERY STILL REMAINS the treatment of choice for gastric carcinoma. Dishearteningly, however, nothing new has been added to the surgical management of gastric cancer over the last several decades. Earlier enthusiasm for radical resection has now been replaced by interest in less formidable procedures. Except in selected cases, where total gastrectomy may be indicated, subtotal gastrectomy with en bloc resection of the adjacent lymph nodes generally is considered optimal for carcinoma of the antrum and body of the stomach. Despite the continued decline in the incidence of gastric cancer, its outlook for the individual patient continues to be dismal. Only half of the patients with gastric carcinoma are operable with the potential for cure; the remaining patients depend on other adjuvants, mainly chemotherapy, for palliation and, occasionally, survival.

Voluminous information exists on the current role of chemotherapy in treating patients with advanced carcinomas of the gastrointestinal tract. The success rates of the reported series vary considerably. The data presented are often inadequate to permit accurate appraisal of the efficacy of the antitumor agents. We report here on a patient in whom the progress of the lesion could be assessed accurately.

Report of Case

A 65-year-old farmer was seen at the Mayo Clinic with chief complaints of abdominal pain, frequent nausea and vomiting, weight loss, and dizziness. The patient had developed intermittent midepigastric pain over the previous four months. The pain, when present, was dull but constant and had no apparent relationship to eating. It had become worse in recent weeks, with fewer pain-free intervals and more frequent nausea and vomiting, especially after meals. The patient had no history of hematemesis or melena. His appetite had remained good; however, he avoided food to prevent pain and vomiting. His bowel habits had been regular. He had lost 10 pounds during the last four months, and two years previously he had been found to be diabetic. He also had frequent dizzy spells, postural hypotension, vertigo, and occasional diplopia.

Past history included appendectomy and abdominal exploration for small bowel obstruction due to adhesions. He had smoked half a package of cigarettes a day for 20 years and had been taking an oral hypoglycemic agent (250 mg chlorpropamide) once a day for two years. A barium meal roentgenogram made two years previously revealed a normal upper gastrointestinal tract.

Except for slight tenderness in the midepigastrium, physical examination on admission was not revealing. Results of pertinent laboratory tests were as follows: plasma glucose 115 mg/dl, serum creatinine 1.18 mg/dl, serum sodium 140 meq/liter, potassium 4.67 meq/liter, chloride 100 meq/liter, total serum protein 6.7 g/dl, leukocytes 6,400/mm^3, erythrocytes 3.91 x 10^6/mm^3, hemoglobin 11.0 g/dl, hematocrit 33.1%, sedimentation rate 92 mm in 1 hour, serum alkaline phosphatase 62 U/liter, and SGOT 18 U/liter.

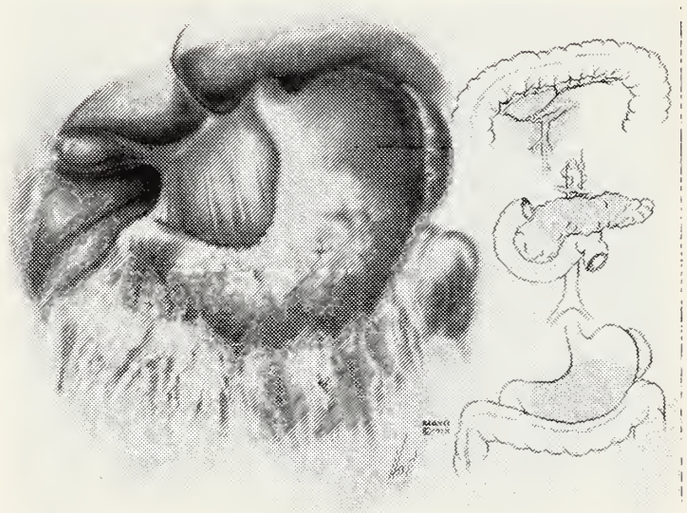


Fig. 1.—Extent of disease at initial exploration. Inserts show tumor in transverse mesocolon, body of pancreas, and periaortic lymph nodes and around midcolic vessels.

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Address for Reprints: D. G. Amamoo, M.D., c/o Section of Publications, Mayo Clinic, 200 First Street SW, Rochester, MN 55901.

Chest roentgenograms showed no abnormalities in the lungs and a moderately calcified aorta. On electrocardiography, he had a heart normal in size for his age with normal sinus rhythm. Roentgenographic films of the upper gastrointestinal tract revealed a large sessile mass in the distal portion of the stomach on the lesser curvature. At gastroscopy an ulcerating lesion involving both curvatures, extending from 8 cm below the gastroesophageal junction to the pylorus, was found. Histologic examination of the biopsy specimen obtained at that time showed grade 3 adenocarcinoma of the stomach.

At subsequent laparotomy, the patient was found to have a large carcinoma involving the distal half of the stomach. The lesion had broken through posteriorly to involve the body and tail of the pancreas and inferiorly to involve the transverse mesocolon around the middle colic vessels; there were also large masses of involved lymph nodes along the aorta as high as the diaphragm (Figure 1). The cul-de-sac, the liver, and the other viscera, however, remained free of metastases. The extent of the lesion precluded even palliative resection.

The patient was started on a vigorous chemotherapeutic regimen that consisted of a combination of 5-fluorouracil, mitomycin C, and cytarabine for the subsequent 12 months. Frequent examinations revealed gradual improvement of his symptoms. No identifiable disease could be documented on physical examination. The patient started to eat well and had no nausea or vomiting. His anemia disappeared, he gained weight, and by the ninth month he was working full time.

Twleve months after the institution of chemotherapy, he presented with a rapidly developing obstruction of the gastric outlet and weight loss. He was explored again by the same surgeon, with the thought that bypassing the obstruction might be possible. At exploratory laparotomy the extent of the lesion was markedly decreased and, though the tumor still remained loosely attached posteriorly to the pancreas, it was limited essentially only to the distal portion of the stomach. It was fairly movable and could be resected easily without resection of any other viscera (Figure 2). Subtotal gastrectomy, partial duodenectomy, and omentectomy could be performed, gastrointestinal continuity being restored by means of an anterior polya (Billroth II type of anastomosis, Hofmeister modification).

Examination of the surgical specimen revealed two grade 3 mucus-producing adenocarcinomas, touching each other, in the antrum 1 cm above the pylorus. The larger lesion (5.5 by 5.0 by 3.0 cm in diameter) had penetrated through the wall into the serosa and fat of the lesser curvature, and the smaller one (2.5 by 2.0 by 1.0 cm in diameter), situated on the greater curvature, had penetrated deeply into the muscularis propria. A single subpyloric lymph node and two on the lesser curvature were found to be metastatically involved. The margins of resection remained free of disease.



Fig. 2.—Cross section of stomach showing extent of lesion at second exploration. Lesion is confined to distal portion of stomach. It could be resected with free margins.

Discussion

The continued decline in the incidence of gastric carcinoma in the United States over the last three decades has led to a low index of suspicion for gastric cancer. Although the incidence of the lesion is now 6 per 100,000 people, as opposed to 36 per 100,000 in 1935,[1] the patients seen today have much more advanced lesions.[2,3] While the incidence of the disease continued to drop, its malignant potential steadily increased. According to ReMine and associates,[4] the lesions today are of a much higher grade than those seen 50 years ago. Much valuable time is lost before the right diagnosis is made. Usually, the patient is asymptomatic and does not seek medical attention until late in the course of the disease. The symptomatic patient is treated erroneously for "benign gastric ulcer" for a long period without benefit.[5] The patient presented here falls into the first category. By the time he was first seen, his lesion was too far advanced to permit curative resection. Even palliative resection would have required an extensive surgical procedure, entailing extensive subtotal gastrectomy with en bloc resection of the body and tail of the pancreas, the transverse colon, the omentum, and the adjacent lymph nodes. Such an extensive procedure would have carried a high operative mortality without encompassing all of the involved adjacent viscera and lymph nodes and thus probably would have added nothing to the patient's survival. A bypass procedure was not necessary at the initial exploration since no gastrointestinal obstruction was then present.

Chemotherapy is not the treatment of choice for gastric carcinoma. It may, however, offer transient benefit to the patient who has advanced inoperable disease. The progress of the lesion may be impeded with significant improvement of the patient's symptoms. Several antitumor agents are currently being investigated. Among these, 5-fluorouracil, doxorubicin, bleomycin, mitomycin C, 1,3-bis(2-chloroethyl)-1-nitrosourea (BCNU), and methyl-1,3-Cis(2-chloroethyl)-1-nitrosourea (methyl CCNU) have shown varying degrees of success.[6–8]

Radiation alone has not been found beneficial in treating gastric carcinoma. In combination with an effective chemotherapeutic agent, however, it may improve patients' survival. Moertel and associates,[9]

by combining radiation with 5-fluorouracil, showed that the survival of patients with advanced gastric cancer was increased from 5.9 months to 14 months. Such limited success has led to intensive combination or multiple drug therapies. Moertel and associates[8] and others have shown that multiple drug therapy seems far superior to the same drugs used singly. In a recent review, they showed that with multiple drug therapy, the one-year survival rate improved 41%.[10,11]

Spontaneous regression of malignant tumors has been reported. In such cases, the disease is overwhelmed by the body's immune systems. The extent of the patient's disease at the initial exploration indicates that his defense systems had been completely overwhelmed by the disease. The improvement of his symptoms during the course of the treatment thus indicates the efficacy of the drugs. While the case presented represents an isolated experience, the result is impressive and should warrant more intensive investigation and trial. It seems pertinent to speculate that perhaps routine combination of such therapy with all gastric resections for gastric carcinoma, especially early lesions, would improve survival.

Clinical evidence satisfactorily indicated that the patient was responding adequately to the treatment. It failed, however, to give an objective appraisal of the progress of the disease. The "second-look operation," by permitting accurate assessment of the extent of the lesion, made surgical resection possible. Reexploration of all patients with inoperable gastric carcinoma, after they have had a chemotherapeutic regimen for a specific period, is therefore recommended cautiously. The rate of resectability may be increased and the prognosis of the patient improved.

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Cover Photograph

"Valley Fair"

Dr. William T. Luckey has taken many pictures at amusements parks, carnivals, and fairs throughout the state as he finds such places fascinating from a photographic aspect. The constant movement of people and machines makes a great setting for shots of all kinds he tells the editors. He tries to take shots that characterize each particular park or event, like he has with the cover photograph of Valley Fair.

Doctor Luckey took the cover photograph with a Konica T-3 camera using Ektachrome film.

He is presently in the midst of a great personal and career change having decided to give up the practice of psychiatry for a residency in radiology at St. Joseph's Hospital in Milwaukee. He and his family are presently living in River Hills, Wisconsin.

Case Report

Detection of Foreign Bodies in the Hand Utilizing Xeroradiography

CHRIS P. TOUNTAS, M.D.,* CHARLES J. MACDONALD, M.D., * RONALD ARTMAN, R.T.†

LOCALIZATION OF non-opaque foreign bodies is often difficult utilizing conventional Xray.

We are presenting two cases in which xeroradiography has been used to locate the presence of foreign bodies in the hand, when conventional Xray has been negative. Non-mammographic application of xeroradiography has been previously described[1-5] and was utilized in these cases to identify suspected foreign bodies.

Xeroradiography is an imaging method used in medical radiography which substitutes a photosensitive selenium coated plate for x-ray film and the image is transferred to paper by a Xerox process. There are two development modes used in xeroradiography, positive and negative.

*Orthopedic surgeon, St. Paul, Minnesota
†Greenville Hospital, Greenville, Pennsylvania.

In the positive mode, thick or dense areas appear dark blue while thin or less dense areas are lighter blue. In the negative mode, the more dense parts such as bone appear white or light blue, while the surrounding soft tissue is darker blue.

Case Reports

The first case involved a 27-year-old housewife who broke a glass ash tray and could feel a small piece on the ulnar side of the right index finger. Conventional Xrays were negative (Figure 1A), but a xeroradiogram utilizing the negative mode revealed a foreign body (Figure 1B) which was removed under intravenous regional block (Figure 1C). The removal was confirmed by post-operative xeroradiogram (Figure 1D).



Fig. 1A—Pre-operative plain Xray.

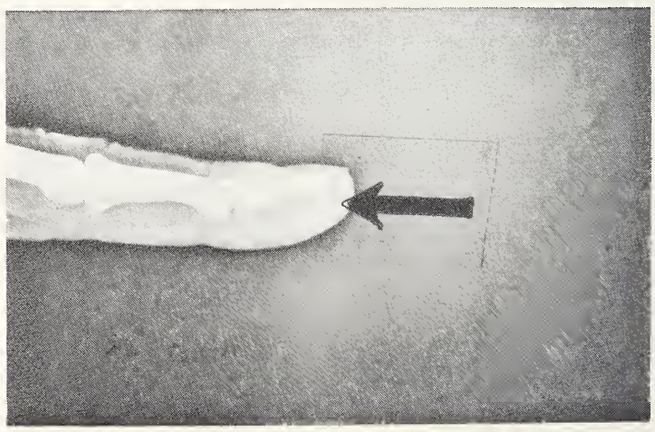


Fig. 1B—Xeroradiogram (see text).

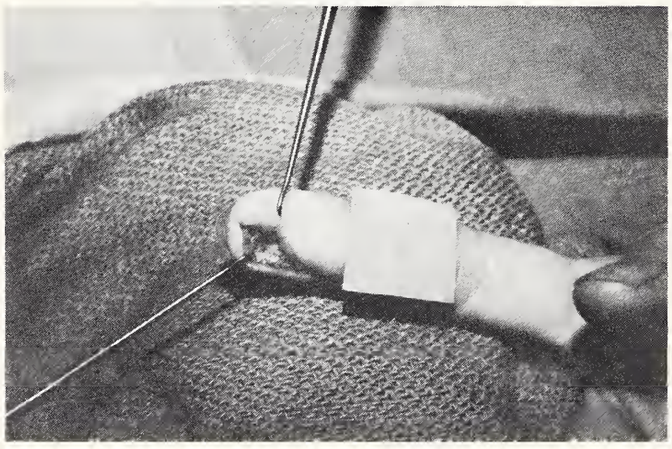


Fig. 1C—Operative specimen. Glass on paper next to wound.



Fig. 1D—Post-operative xeroradiogram.

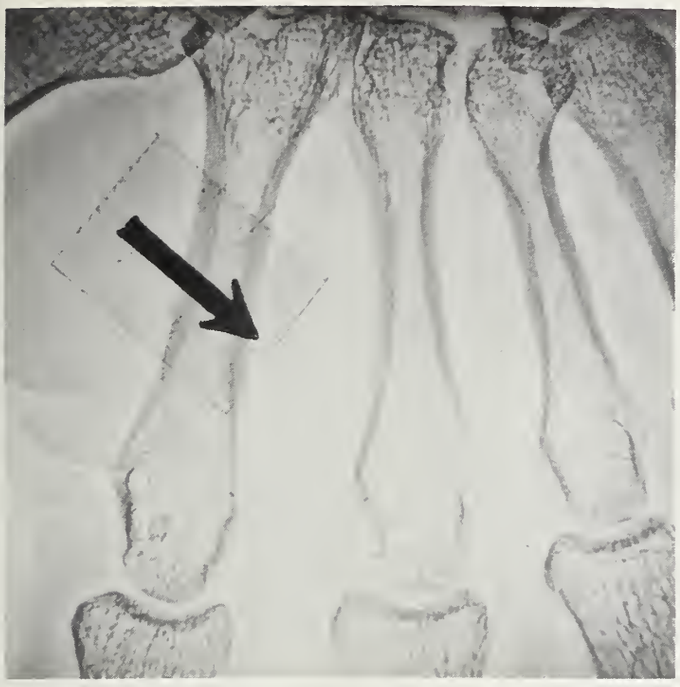


Fig. 2—Reed in palm.

The second case was a 35-year-old hunter who fell on a frozen reed, which penetrated the palm. He removed a portion of the reed. Persistent tenderness, swelling and erythema brought him to the emergency room. Xrays were negative, but the xeroradiogram showed a foreign body (Figure 2). The remaining reed was removed in the operating room under axillary block and tourniquet ischemia.

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The Children's Hospital

Dr. William Brennom, a St. Paul pediatric (children's) surgeon, has been named Chief of Staff of the St. Paul Children's Hospital medical staff for 1978. Dr. Brennom joined the staff in 1972 and has been in private practice in St. Paul since that time.

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Q and A — CME

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Q. Is the Academy of O and O accredited?

A. The American Academy of Ophthalmology and Otolaryngology is accredited by the Liaison Committee on Continuing Medical Education (LCCME). Other organizations so accredited are listed in the AMA-PRA booklet and the annual CME issue of JAMA. Only these accredited organizations may "certify that the CME activity (it) is sponsoring or co-sponsoring meets the criteria for Category I" (for the Physician's Recognition Award).

Q. Why so many reports? Can't they all get together with a standard form?

A. We asked QA-CME for a long answer and a short answer: Long answer: Currently 16 state medical associations, 12 national organizations and 13 state board of medical examiners have CME requirements. Nine other states are in various stages of implementing CME requirements. Some of these reciprocate. Some choose not to do so. Short answer: I drive a Chevrolet.

Q. When I sent in my CME materials for the Physician's Recognition Award, the AMA would not allow some of my Category I activities. How come?

A. Only those activities planned, sponsored or cosponsored by an accredited organization ***and*** *certified as meeting the requirements of Category I CME (AMA-PRA) qualify.* ***Not well advertised to PRA applicants is the necessity to list the LCCME accredited sponsor or cosponsor*** *as the PRA entry rather than a less definitive statement of the type of activity. QACME is pleased to be able to help clarify this common misunderstanding.*

Q. How can I verify my participation in CME activities?

A. Organizations sponsoring or cosponsoring CME activities should furnish attendees that information at, or shortly after, the meeting. As yet, the reliability of this process varies considerably. For example, the AMA maintains a cumulative tabulation of attendance only for programs the AMA sponsors. Until a uniform method evolves, the ultimate responsibility rests with the individual physician to acquire reasonable proof of his attendance.

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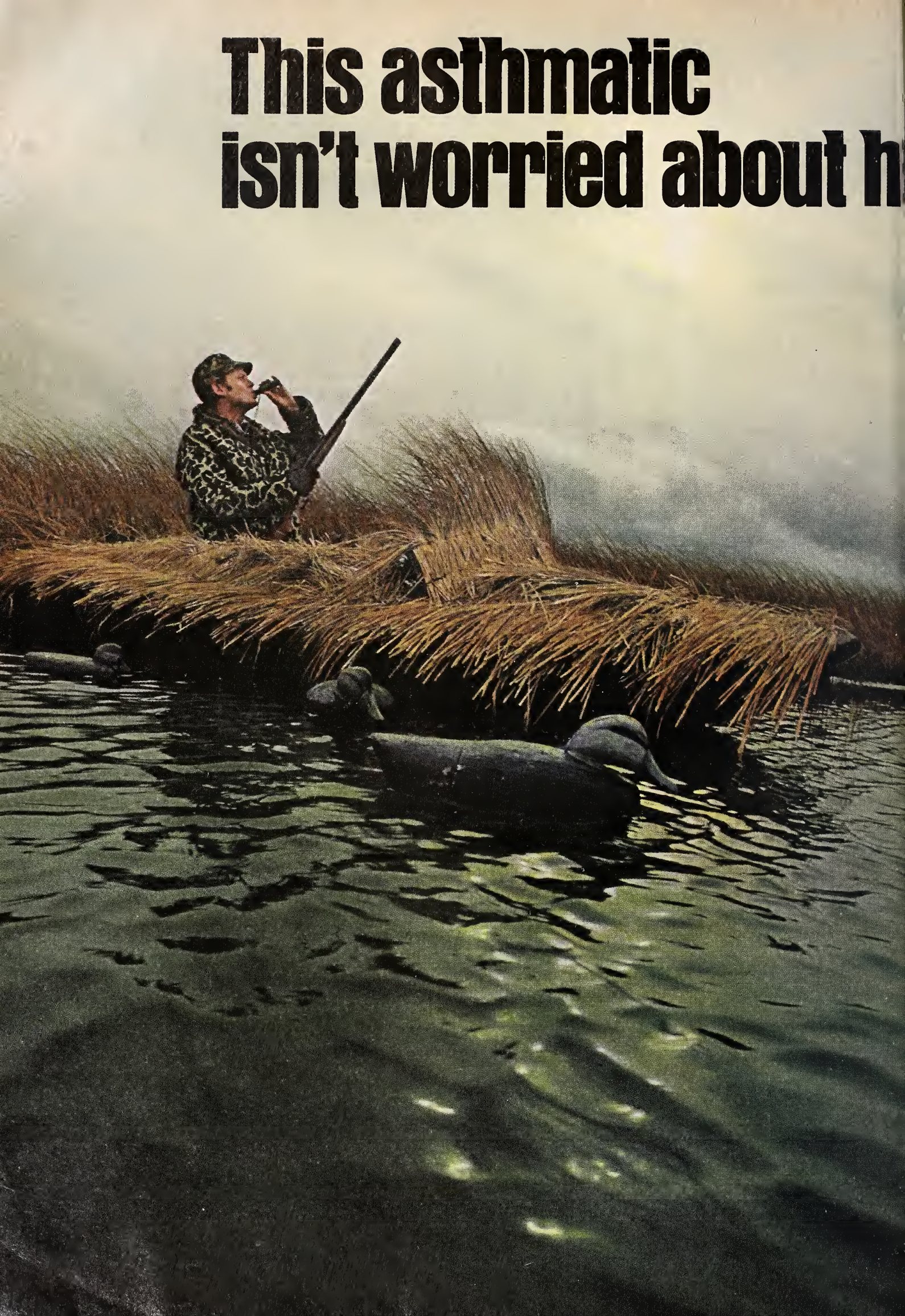
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Reference 1. Data on file. Mead Johnson Pharmaceutical Division.

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Theophylline dosage may be cautiously increased to 2000 mg/24 hour in adults and 9 or 10 mg/kg every 6 hours in children. Monitoring of serum theophylline levels at higher dosages is recommended.

Precautions: Do not administer more frequently than every 6 hours, or within 12 hours after rectal dose of any preparation containing theophylline or aminophylline. Do not give other xanthine derivatives concurrently. Use in case of pregnancy only when clearly needed.

Adverse Reactions: Theophylline may exert some stimulating effect on the central nervous system. Its administration may cause local irritation of the gastric mucosa, with possible gastric discomfort, nausea, and vomiting. The frequency of adverse reactions is related to the serum theophylline level and is not usually a problem at serum theophylline levels below 20 μg/ml.

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Editorials

Rubeola Immunizations

THE ARTICLE by Priest, Peterson, and Forfang* should be studied by all physicians and health personnel who care for children, since the problems of measles (rubeola) vaccination are well summarized.

The present recommendation that measles vaccination be done at the age of 15 months will result in an unknown number of infants less than 15 months of age who are susceptible to measles. However, the recommendation works well in practice.

The mobile fraction of our population with incomplete, dubious, or absent immunization records is frustrating, especially if the year of immunization was most likely prior to 1968. A solution is to declare the child's immunization status doubtful and advise reimmunization. Children who have recently been reimmunized at school or elsewhere are likewise difficult to identify.

Scattered records, primary immunization failures, and waning immunity are problems which need not deter us from the major goal of appropriate administration of immunizations to all children.

Detlof M. Olson, M.D.
Minneapolis, Minnesota

*See page 296.

Management of Refractory Hypertension

THE ARTICLE BY Sweet, Danielson, and Wathen in last month's issue clearly demonstrates the potency of clonidine for lowering blood pressure in certain refractory cases. It is a valuable new agent in the physician's armamentarium. Their article focuses on the treatment of the refractory hypertensive patient. This brings to mind several "principles" which have been useful in managing such patients:

1. Patients with hypertension secondary to a partial stenosis of the renal artery are, as a group, most difficult to treat with drugs. As one lowers the blood pressure with medication, the kidney senses the drop in perfusion pressure and "fights back" physiologically to regain the previous high level of arterial pressure. For this reason, stubborn refractoriness to medical treatment should alert the physician to the possibility of a renal artery stenosis. Appropriate diagnostic procedures can then be taken.

2. On rare occasions, the taking of oral contraceptive agents can produce a hypertension quite refractory to treatment. If the contraceptive pill is discontinued, the elevated blood pressure gradually begins to respond to anti-hypertensive therapy over the succeeding one to four months.

3. If a patient has a refractory hypertension even on high doses of medication, consider adding a diuretic agent. The other anti-hypertensive agents may have initially lowered blood pressure, and thereby may have caused the kidneys to retain body sodium. Such sodium retention tends to raise blood pressure and makes the patient resistant to the action of the drugs.

*Page 215.

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from papers presented at 82nd Annual Mtg. - A.A.O.O. as reported in Dec./77 "Hearing Instruments"

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as quoted by Lindsey Pratt, M.D.

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Clyde F. Marquardt

Adding the diuretic removes excess body sodium and thereby re-sensitizes the patient to anti-hypertensive drug action. The second and ninth patients in the article by Sweet et al. demonstrate this principle. In both instances, the authors added a diuretic along with clonidine and lowered the blood pressure.

4. Consider the NaCl intake. Even a patient with relatively normal renal function can make himself refractory to treatment by eating a huge amount of salt. However, this principle is especially cogent in the hypertensive patient with some type of renal parenchymal disease. In such azotemic patients with partial nephron loss, there is usually a tendency for Na retention which is an important factor in their hypertension. If such a patient takes in 200 to 400 mEq of sodium in the daily diet, he may become quite refractory to all types of treatment for this reason alone. On the other hand, if this patient will gear down to an intake of 60 mEq of Na daily, the blood pressure will usually become lower and quite amenable to drug therapy. In this same type of patient, diuretics can be useful along with the low Na intake. However, many diuretics are not powerful enough in the face of the renal parenchymal disease. The cautious addition of furosemide in such patients, along with dietary salt limitation, can be very helpful in conquering a refractory hypertension. However, watch for serum electrolyte changes in the azotemic patient as furosemide begins to have its effect.

5. In patients with very fat arms, use a large blood pressure cuff. A small cuff on a very fat arm can give the illusion of a refractory hypertension.

6. In refractory hypertension, it is often necessary to use several drugs simultaneously. In order to preserve a patient's usual life-style while doing this, serious side-effects should be avoided. This can often be done by giving a dose of each individual drug which is low enough to be nicely tolerated without causing symptoms. Individual drugs may be especially well suited to particular people. One should choose the combination which gives the greatest blood pressure lowering with the fewest side-effects.

In the refractory patient, beta-blocking drugs, such as propranolol, can be very useful when combined with diuretics and are generally free from major side-effects. One can often go up gradually to 480 mg daily without too many untoward symptoms. Asthma, heart failure from causes other than hypertension, various heart blocks, and Raynaud's disease are the main contraindications.

Clonidine can also be useful, as the article by Sweet et al. indicates.

Methyl-dopa can be a powerful anti-hypertensive drug. Side-effects are lessened by prescribing no more than 1,000 mg daily.

Hydralazine is a useful adjunct in the refractory case, going up gradually to 150 mg daily if necessary. If a diuretic and beta-blocker accompany it, it does not cause cardiac acceleration or sodium retention.

Guanethidine is a useful adjunctive drug in the refractory patient. Some patients can tolerate no more than 10 mg daily without nuisance side-effects. However, this 10 mg daily dose can often give that extra measure of anti-hypertensive action which is sought after.

Reserpine and other rauwolfia products *in small doses* can also be useful in just the right refractory patient. In order to avoid side effects, it may be prudent to give no more than .1 mg of reserpine daily or no more than one 2 mg Rauwiloid pill daily.

Prazosin can also be useful in the refractory patient. Start with 1 mg daily, since some patients may initially be quite sensitive to the alpha-adrenergic blocking action of the drug. However, very shortly, some tolerance to the drug builds up and larger doses are then easily prescribed. The drug is an arterial vasodilator as well as an alpha-adrenergic blocker.

7. In patients with malignant hypertension, it is mandatory to bring the pressure down within about 10 days. In achieving this, one can take advantage of the clinical principle that bed rest in a hospital has a mysteriously powerful anti-hypertensive action. The physician can put this force to use by placing the patient with malignant hypertension in the hospital for treatment. While there, the persistent control of diet and drugs, plus the very salutary effect of bed rest, will usually allow a prompt decrease of blood pressure to near the normal range.

Louis Tobian, M.D.*
Minneapolis, Minnesota

*Chief of the Hypertension Section, University of Minnesota Hospital, Minneapolis, Minnesota.

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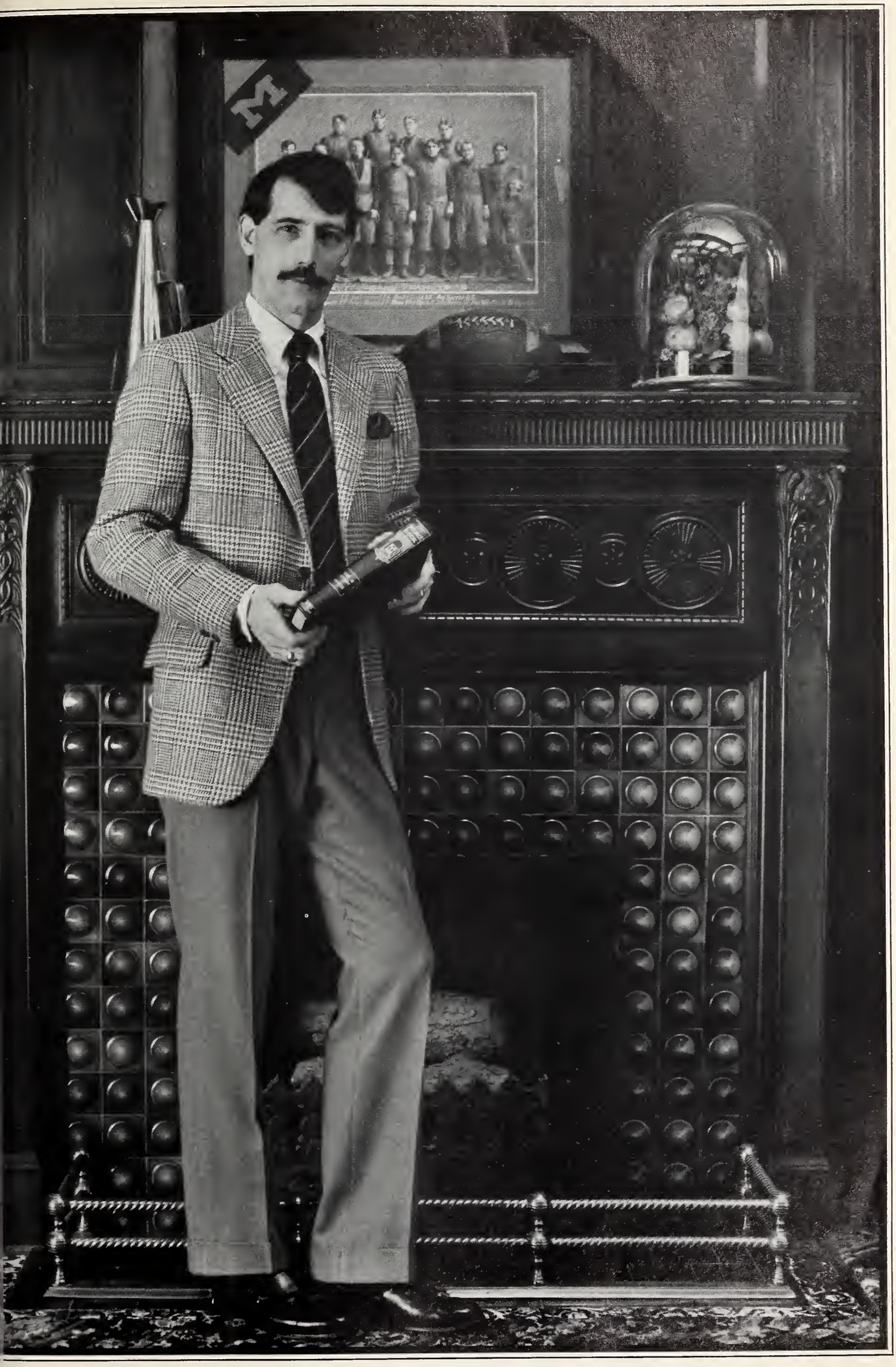
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(Continued from page 318)

Preventive Medicine

Rubeola Immunizations and the 1977 Measles Outbreak in Minnesota

JOHN R. PRIEST, M.D.;* DIANE C. PETERSON;† and JAN C. FORFANG†

In 1977, a major measles (rubeola) outbreak occurred in the United States and Minnesota. Children, especially teenagers, immunized with some of the early vaccines according to the early vaccination schedules are frequently infected. Vaccines, schedules, and vaccination failures are reviewed. Recommendations for reimmunizing children at risk are made.

PRIOR TO 1963 AND the development of effective rubeola vaccines, there were approximately 500,000 reported cases of measles in the United States each year, including about 500 cases of encephalitis and 400 measles-related deaths.[1] The use of measles vaccines resulted in a 90-95% reduction in reported cases by 1968 (Figure 1). Since then an average of 36,500 cases has been reported each year. However, in 1971, there were 75,000 cases, with a proportional increase in encephalitis and death following the expiration of nationwide immunization project funding in 1968 (Figure 1).[1] Funds and immunizations were reinitiated in mid-1971, and an immediate decrease in cases followed. Since 1975, another increase in reported cases has occurred with nearly every state involved.[2,3] In the first six months of 1977, 50,000 cases were reported.[3] Minnesota is one of the more severely affected states.[4] In the first six months of 1977, there were 2623 reported cases of measles in Minnesota, more than any other year since introduction of the vaccine in 1963 (Figure 2).[5] Two cases of measles encephalitis have been reported.

An important reason for the recent increase in measles is the accumulation of susceptible persons

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Address reprint requests to: John R. Priest, M.D., University of Minnesota Hospitals, Box 56 Mayo, Minneapolis, MN 55455.

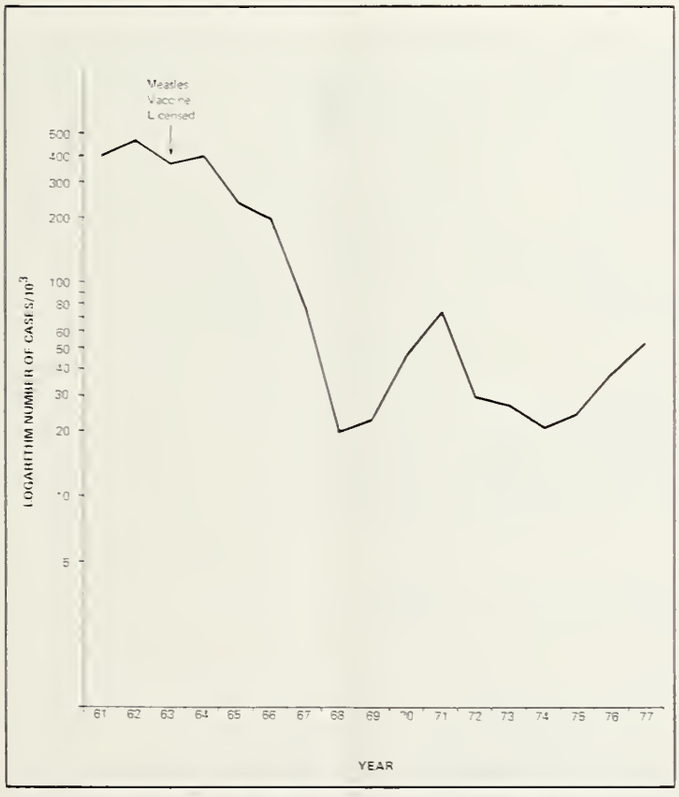


Fig. 1—Reported cases of measles by year in the United States, 1961 to 1977 (January to June). Source: References 1,2,3.

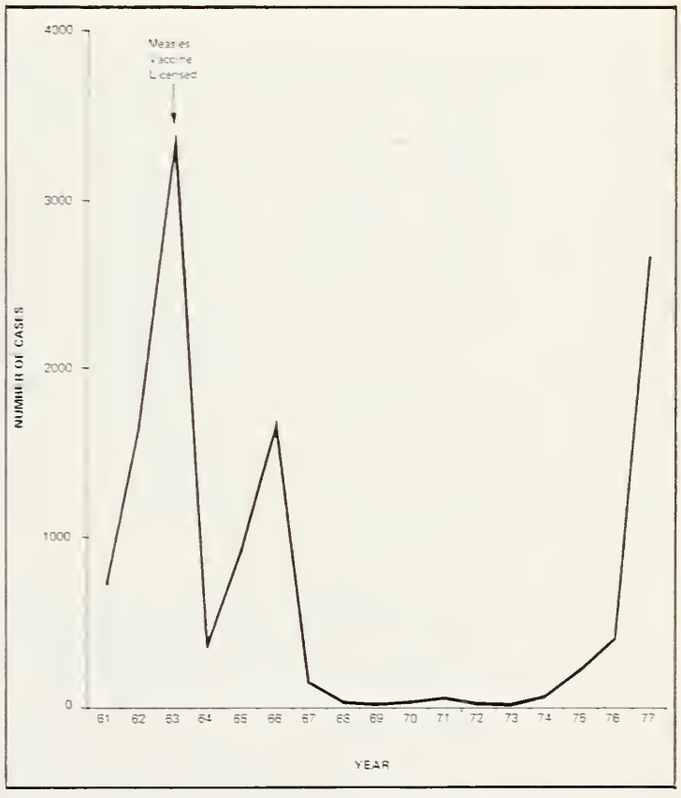


Fig. 2—Reported cases of measles by year in Minnesota, 1961 to 1977 (January to June). Source: Minnesota Department of Health.

with inadequate immunity. This accumulation results from various vaccine failures, and, of course, from the failure to vaccinate at all. The purpose of this paper is to review the use and effectiveness of the various vaccines, to describe the demographic features of the current outbreak in Minnesota, to define the population at high risk, and to make recommendations for protecting this high-risk population.

Vaccines and Immunization Regimens

Three types of rubeola vaccines have been available from several manufacturers (Table 1). In 1963, a killed virus vaccine was licensed and was used by some physicians until 1965; it was withdrawn from the market in 1967. The killed vaccine provided only short-lived protection,[6] and children who had received it were occasionally found to have severe atypical measles if exposed to the natural disease.[7] It was replaced by, or used in combination with, the live attenuated measles virus vaccine also licensed in 1963.

The live attenuated virus vaccine, also known as the Edmonston B strain vaccine, was a very reactive vaccine and, when used properly, induced active immunity in approximately 95% of susceptible children.[8,9] Antibodies persist for at least 14 years.[8] Because of the side-effects induced by the vaccine in 30-40% of children (fever to 103° F. for two to five days with or without cough, coryza, conjunctivitis, rash and Koplik's spots), it was recommended that the live attenuated vaccine be accompanied by a separate injection of immune serum globulin or measles immune globulin.[6] Antibodies following this regimen have also persisted for 14 years.[8] The live attenuated virus vaccine was also given in combination with killed virus vaccine, the latter given to lessen the side effects of the live product.[10] This regimen is now known to be associated with inadequate long-term immunity.[8] The live attenuated virus vaccine was distributed by the Minnesota Department of Health (MDH) in late 1967 and early 1968.[11]

In 1965 live, *further* attenuated measles virus vaccine was the third type to become available.* Depending on the manufacturer, this vaccine is derived from the Schwarz virus strain or from an Enders attenuated Edmonston virus called the Moraten strain (Table 1). This further attenuated virus does not produce as severe a clinical illness as the Edmonston B vaccine, and it is not to be used with killed virus[12] or immune serum globulin.[12–14] This vaccine has induced antibodies persisting for at least 14 years in children,† although titers are somewhat lower than those found after immunization with the Edmonston B vaccine given alone or with immune serum globulin.[8] Since 1968, the live, further attenuated vaccine has been the

*The *official* name of both the live attenuated virus vaccine and the live, further attenuated virus vaccine is "Measles Virus Vaccine, Live, Attenuated".[9]

†The children studied were immunized before live, further attenuated vaccine was approved for general use in 1965.

TABLE 1
Measles Virus Vaccines

Type	Virus Strain	Manufacturer	Trade Name
Killed virus	Edmonston	Pfizer	Pfizer-Vax Measles-K®
	Edmonston	Lilly	no trade name [a]
Live, attenuated virus	Edmonston	Merck, Sharp & Dohme	Rubeovax®
	Edmonston	Pfizer	Pfizer-Vax Measles-L®
	Edmonston	Philips-Roxane	no trade name [b]
	Edmonston	Lederle	M-Vac®
	Edmonston	Lilly	no trade name [b]
	Edmonston	Parke-Davis	no trade name [b]
Live, further attenuated virus	Schwarz	Pitman-Moore (Dow)	Lirugen®
	Moraten	Merck, Sharp & Dohme	Attenuvax®
	Moraten	Merck, Sharp & Dohme	M-M-R® [c]
	Moraten	Merck, Sharp & Dohme	M-R-Vax® [d]

[a] marketed under generic name: "Measles Virus Vaccine, Inactivated"
[b] marketed under generic name: "Measles Virus Vaccine, Live, Attenuated"
[c] combined measles, mumps, rubella vaccine
[d] combined measles, rubella vaccine

Sources: New and Nonofficial Drugs, American Medical Association Council on Drugs. J. B. Lippincott Co. (Philadelphia) 1964.
New Drugs, American Medical Association Council on Drugs. American Medical Association (Chicago) 1965, 1966 and 1967.
AMA Drug Evaluations, American Medical Association Council on Drugs, American Medical Association (Chicago) 1971.
AMA Drug Evaluations, American Medical Association, Department of Drugs, Publishing Sciences Group, Inc. (Acton, Massachusetts) 1973.

preferred vaccine; this vaccine is the rubeola portion of currently available bivalent and trivalent vaccines. This form of vaccine has been distributed by MDH since mid-1968.[11]

In addition to three vaccines in use in the past 14 years, the recommended age for rubeola vaccination has varied. Prior to 1966, the recommended age was 9 months.[15,16] From 1966 through 1976, it was 12 months.[6] Since October, 1976, the United States Public Health Service and the American Academy of Pediatrics have recommended that the vaccine be given at 15 months of age.[13,17] These changes result from the finding that maternal antibody persists up to 15 months after birth in some infants and that these antibodies prevent the inducement of active immunity by a vaccine.[17–20] The seroconversion rate to further attenuated measles virus vaccine is 80-85% for children vaccinated at 12 months of age; it is more than 95% for children vaccinated after 13 or 14 months of age.[17–20]

Whether an adequately immunized child ever loses his or her protection is an unanswered question. Children with very low measles antibody titers (<1:2 by hemagglutination-inhibition) have anamnestic titer rises when re-exposed to measles virus 14 years after first exposure.[8] Routine measles booster immunizations are not recommended.[13,17]

The 1977 Minnesota Measles Outbreak

The Minnesota Department of Health recorded 2623 cases of rubeola in the first six months of 1977. A suspected case is investigated by MDH, and if there was a typical clinical course, the case is recorded. In fewer than 1% of these cases were specimens available for serologic confirmation of the disease.

The earliest reports of rubeola were from southwestern Minnesota, but soon 65 of the state's 87 counties had reported measles. The number of cases peaked in April and had fallen considerably by June (Figure 3). This decrease was to be expected because measles is a late winter disease with few cases in the second half of the year even during major epidemics.[21]

The most striking and useful information is revealed by examining the age-related incidence of measles in the current outbreak and by comparing age to the types of vaccines and vaccination schedules in use during the infancy of the children infected now (Figure 4). The 1977 outbreak most heavily affected children ages 12 through 17 years, consistent with a trend throughout the United States toward older affected children in recent epidemics.[2,8,22,23] In contrast, before vaccines were available urban children were most heavily

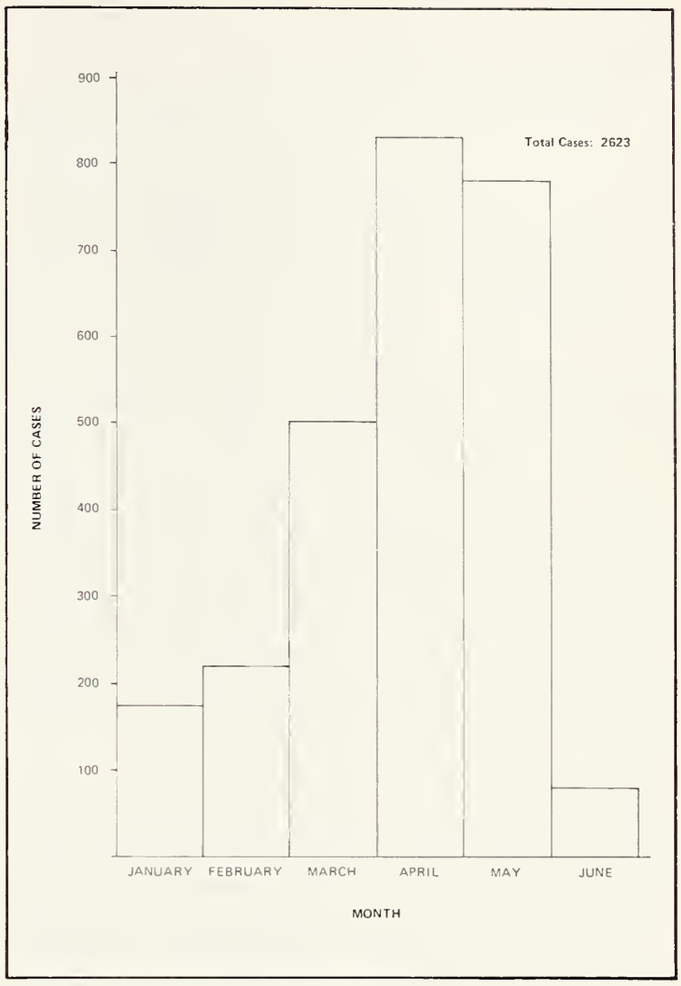


Fig. 3—Reported cases of measles by month in Minnesota, 1977. Source: Minnesota Department of Health data.

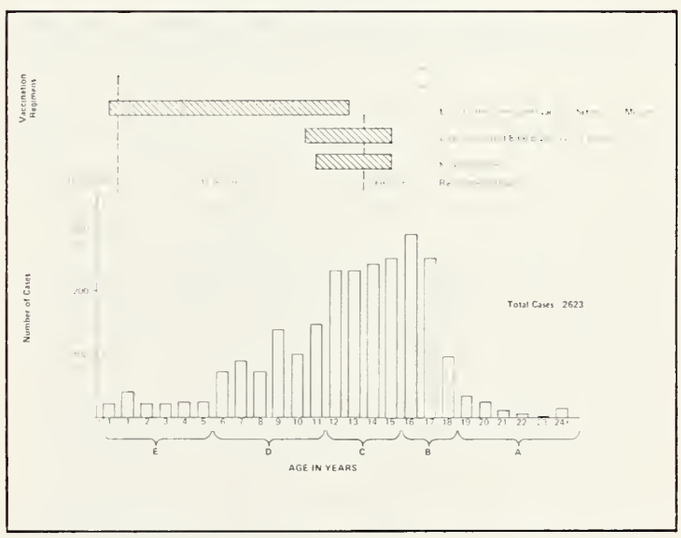


Fig. 4—Age distribution of reported rubeola cases in Minnesota, January to June, 1977, and vaccination regimens in common use during infancy by current age of child. Age sub-groups A through E represent cohorts who have had different susceptibility to measles (1) because of their exposure to natural measles or (2) because of the different vaccines and vaccination regimens to which they were subject as infants or toddlers. See text for further explanation. Source: Minnesota Department of Health data.

affected between one and five years of age and rural children between five and nine years.[1]

Some understanding of the accumulation of susceptible children, especially teenagers, comes from examining the vaccination regimens to which they were subject as young children. Individuals 19 years of age or older (A in Figure 4) were rarely affected in the 1977 outbreak and were probably protected by natural immunity following measles infections during their infancy. Individuals age 16 through 18 years (B in Figure 4) perhaps avoided natural measles during their early years by immunization as toddlers either with killed virus vaccine or with live, attenuated virus vaccine (which may have been given alone or with immune globulin or killed vaccine). In 2596 cases of measles in the 1977 Minnesota outbreak, 338 (13%) of the children were vaccinated before 1968 but after the age of one year.[5] However, as mentioned earlier, it is now known that vaccination schedules which included killed virus vaccine alone or with live virus vaccine provided only short-lived immunity.[8]

Individuals age 12 through 15 years (C in Figure 4) perhaps avoided natural measles in their early years by immunization at nine or 12 months of age according to one of the then accepted vaccination regimens. Again, not only do some of those regimens fail to produce immunity,[8] but vaccination at the age of nine or 12 months is also known to be associated with inadequate long-term immunity in at least 15% of children.[8,17–20]

Children now six to 11 years old (D in Figure 4) may have been protected from earlier measles for several reasons. They were most likely vaccinated with the live, further attenuated virus, but probably at 12 months of age. Because rubeola was declining in incidence, their natural exposure would have been limited. They might have received the live, *further* attenuated vaccine given by mistake with immune globulin resulting in short-term immunity.[8,14]

The youngest children affected in the 1977 outbreak (E in Figure 4) probably represent two groups: those who were never immunized or those immunized at 12 months of age. A random sample of two-year olds surveyed in Minnesota in 1977 revealed that 10% of the children had no history of measles immunization.[5] Among 2596 cases in the 1977 outbreak, 26% occurred in children who had never been vaccinated, and another 20% occurred in children with an unknown vaccination history.[5]

At all ages immunization failures can occur when vaccine potency is lost. This may occur after prolonged storage, after mixing the vaccine in a single syringe with immune serum globulin, or after exposure to light or heat.[24] The unprotected status of some children is obscured by inaccurate parental recall of vaccination status. Injection of immune globulin after exposure to measles has also been misinterpreted by parents as a form of permanent measles immunization.[22]

Finally, MDH is concerned that individuals immunized at any age with live attenuated virus vaccine and immune serum globulin may be inadequately protected. The reason for this is the variability of doses of immune globulin used in the past and the chance that too large a dose was given, thus preventing the development of adequate immunity. The dose of immune serum globulin which ameliorates vaccine-related side effects but allows an immunologic response (0.02 ml/kg body weight) is less than one-tenth of the dose which protects an individual from measles after exposure (0.25 ml/kg body weight).[13] Inaccuracies in doses and imprecise record keeping have been noted by MDH and others.[25]

In summary, several factors including type of vaccine, age at vaccination, and vaccination schedule identify a group of children who may not be adequately immunized and who are at risk for measles infection and its potential complications (Table 2). Probably the single most important reason for susceptibility is that many children have never been immunized.

TABLE 2
Individuals at Risk for Measles Infections

1. **Those who have never had natural measles.**
2. **Those who have never been immunized.**
3. **Those immunized with a killed virus vaccine alone or with killed virus vaccine followed shortly (<3 mo.) thereafter by live attenuated virus vaccine.**
4. **Those immunized before 12 months of age; perhaps those immunized between 12 and 15 months.**
5. **Those immunized with live, attenuated virus vaccine and an excess (>0.02 ml/kg body weight) of immune serum globulin.**
6. **Those immunized with live, *further* attenuated virus vaccine plus immune serum globulin (intended for use only with the more reactive live, attenuated virus vaccine).**
7. **Those immunized with vaccine which may have lost its potency because of exposure to light or heat or aging, or because of mixing it with immune serum globulin in one syringe.**
8. **Children six to 15 months of age in an outbreak region.**

Recommendations

The immunization status of all persons under 18 years of age should be reviewed with particular attention to the types of vaccine failures described above (Table 2). The Committee on Infectious Diseases of the American Academy of Pediatrics and the United States Public Health Service Advisory Committee on Immunization Practices do not recom-

mend the routine reimmunization of children who received live attenuated virus vaccine at 12 months of age or older.[13,17] Revaccination is recommended if children were vaccinated before age 12 months, particularly if measles immune globulin or immune serum globulin was used.[13]

The Minnesota Department of Health recommendations differ slightly from the above. MDH recommends revaccination of all children immunized before 12 months. However, because of possibly excess doses of immune serum globulin as discussed above, MDH also recommends reimmunization of all children who received live attenuated virus vaccine with immune globulin at any age.[11]

In general, when there is doubt about the immunization status, the child should be given live, further attenuated virus vaccine.[14,17] Reimmunization of persons with natural or vaccine-induced immunity has not been associated with serious reactions or complications.[8] Occasional local reaction at the site of injection has been reported when live virus vaccine is given after killed virus vaccination,[13] but children who have received only killed virus vaccine should be reimmunized with live, further attenuated vaccine to avoid the possibility of atypical measles.

In measles outbreak situations, containment of the disease and individual protection is provided by immunizing all susceptibles with live, further attenuated virus vaccine.[14] Exposed suspectibles are protected if vaccination is given shortly (within two days) after exposure.[13] Infants six months of age or older can be vaccinated safely but must be reimmunized at 15 months to assure long-term immunity.[8,11,17] Immune serum globulin (0.25 ml/kg body weight) also provides immediate protection if given within 6 days after exposure.[13] It should not be used for overall outbreak control, but only for: (1) exposed susceptible household contacts, especially infants, whose exposure to virus usually extends for more than two days before the illness is recognized in the household, (2) exposed susceptible pregnant women, and (3) others in whom live virus vaccines are contraindicated (see below).[14] If immune serum globulin is used, active immunization should be given three to four months later (or after completion of pregnancy) except when contraindicated.[13]

The contraindications to use of live measles virus vaccine are as follows: pregnancy, lymphoreticular or generalized malignant disease, impaired immunity due to immunologic disease or immunosuppressive therapy, severe febrile illness, untreated active tuberculosis, administration within the preceding three months of blood or serum products which might neutralize the virus.[1,9,13] Minor respiratory illnesses with low grade fever do not necessarily preclude vaccination.[13,26] In patients with known sensitivity to eggs, the benefits of immunization must be weighed against the remote possibility of hypersensitivity reactions.[13,27,28] Reactions to trace antibiotics used during virus culture have occurred rarely and should be considered in children with known sensitivities (see manufacturer's insert with vaccine).[13]

Acknowledgment

The authors express their appreciation to Doctors G. Scott Giebink and Edward L. Kaplan, Division of Infectious Diseases, Department of Pediatrics, University of Minnesota School of Medicine for their suggestions and review of the manuscript.

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Laboratory Letter

ELISA — New Girl Around Town

CHARLES W. JARVIS, M.D.*

Almost two decades ago Yalow and Berson[1] introduced the world to radioimmunoassay. Their technique of attaching a radioisotope to an antigen or antibody was so good it not only helped to earn Dr. Yalow a Nobel prize, but it revolutionized the testing for substances, such as hormones, which are present in micro- or nanogram amounts, and which previously had been measured indirectly or not at all.

RIA has many advantages: it is easy to perform; it is highly specific; it has exquisite sensitivity, and it can be adapted to measure any substance against which an antibody can be produced. But RIA also has several major defects. It uses expensive equipment and unstable reagents. It requires special training and licensure, and it is potentially dangerous to technicians. There is also a growing problem of waste disposal.

In 1971 Engvall and Perlmann[2] introduced their brainchild to the world and called her ELISA- enzyme linked immunosorbent assay. In this procedure (Figures 1 and 2), an enzyme is attached to an antibody or an antigen. This complex is allowed to react with a patient sample, and then is exposed to a substrate which is specific for the enzyme tag. The amount of color change which results is proportional to the amount of substance being measured. The enzyme/substrate combination is chosen so it can be read visually or in a simple spectrophotometer — thus allowing qualitative or quantitative answers to be given rapidly and at very low cost.

The ELISA technique, which has spawned a host of variations and modifications in the past six years, has RIA's advantages of high specificity, exquisite sensitivity and ease of operation. But ELISA, unlike RIA, uses stable reagents and inexpensive spectrophotometers that are available in any laboratory. Perhaps of even more importance, there is no danger of exposure to radioisotopes and no problem of waste disposal.

ELISA may well develop along two different lines.[3]

*Childrens Hospital, St. Paul, Minnesota.

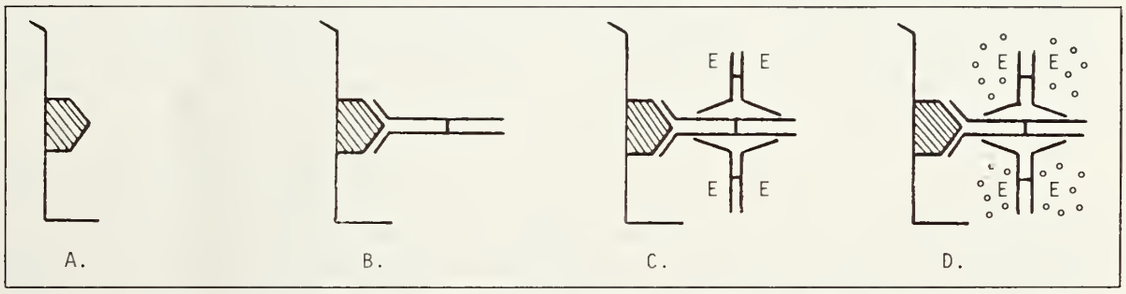


Fig. 1 — Indirect ELISA using labeled antibody (A), Antigen is attached to the wall of a tube. (B) Serum is added; specific antibody attaches to the antigen. (C) Enzyme — labeled anti-human globulin is added and attaches to specific antibody. (D) Substrate is added. The amount of hydrolysis is proportional to the amount of specific antibody in the original sample.

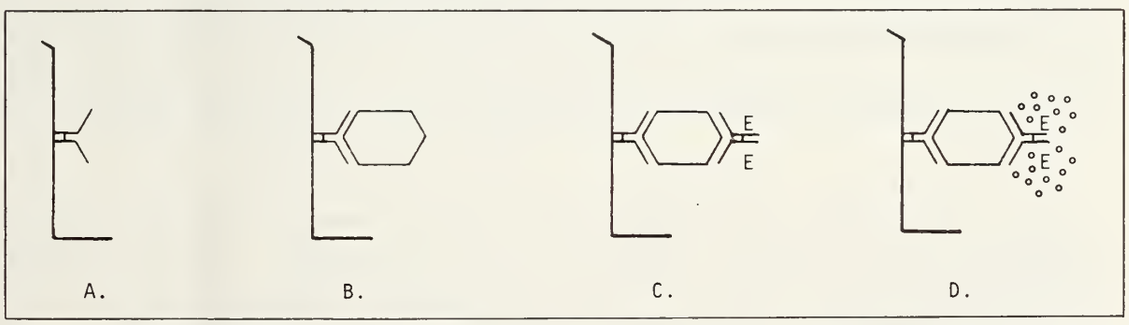


Fig. 2 — Double antibody, "Sandwich", ELISA (A) Antibody is attached to the wall of a tube. (B) Serum is added; antigen attaches to the antibody. (C) Enzyme-labeled specific antibody is added and attaches to any antigen present. (D) Substrate is added; the amount of hydrolysis is proportional to the amount of antigen present.

One line of development could eventually replace RIA in the measurement of hormones, trace serum proteins, such as IgE and α-fetoprotein, and HB_sAg screening. This would make it possible for most laboratories to determine substances such as insulin, growth hormone, etc., which measurements are now obtainable only from large centers. It will also bring the benefits of therapeutic drug monitoring to the bedside of all patients. This is already beginning to happen for theophylline and some of the antiepileptic drugs such as phenytoin, phenobarbital, primidone and carbamazepine. Reagents for some of the cardiac glycosides and gentamicin will soon be available.

The other path that ELISA is taking leads into the area of testing for antibodies to infectious diseases of all types. Rubella, syphilis, brucellosis and salmonellosis show promise. Extensive work is being done on malaria, amebiasis, Chagas disease and sleeping sickness. Interesting results are also being obtained in the mass testing of meat animals for disease such as hog cholera and trichinosis. It looks as though Eva Engvall's brainchild is rapidly coming of age.

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Minnesota Medical Association Auxiliary

The Auxiliary in Duluth

An interesting, informative and exciting program is planned for the Annual Meeting of the Minnesota Medical Association Auxiliary in Duluth, May 11-12. Headquarters for the convention will be Duluth's new Normandy Inn.

All Thursday functions will be held at the St. Louis County Heritage and Arts Center (The Depot). A registration desk will be located at the Depot on Thursday, 8 A.M.-Noon. A continental breakfast ($1.00) will be served in the Multi-Media Room from 8-9 A.M. The Pre-Convention Meeting, open to all members of the Auxiliary, will begin at 9 A.M.

The President's Recognition Luncheon ($6.00) will be held in the Lake Superior Museum of Transportation. One of the newest of its type, this museum has been acclaimed for possessing one of the finest collections of historical railroad equipment in this country. A social hour will begin at noon, followed by the luncheon at 12:30 P.M. A unique presentation by the Duluth Ballet Company will highlight the luncheon program. Also featured will be the Choralaires — a singing group from Duluth East High School. Guided tours of The Depot will be available following the luncheon. Honored guests at the luncheon will be those who have belonged to the State Auxiliary for 40 years.

All Friday functions will be held at Northland Country Club. Transportation will be provided from the Normandy to Northland. Continental breakfast ($1.00) will be served from 8-9 A.M., followed by the Annual Meeting from 9 A.M.-Noon. Mrs. William G. Halverson, President, will preside at this meeting which is open to all members of the Auxiliary.

The Annual Luncheon ($6.00) will begin at 12:30 P.M., preceded by a noon social hour reception honoring Mrs. Manuel Bergnes, President-Elect, American Medical Association Auxiliary, our state president, president-elect and vice presidents. During the luncheon there will be informal modeling of women's and children's clothing from several Duluth stores. The installation of new officers will also take place at the luncheon.

Mrs. Rodney Langseth and Mrs. Jack Wall are co-chairmen for the Auxiliary Annual Meeting.

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Communication

You've been reminded recently that the Minnesota Medical Association is your professional advocacy organization. This is where your opinions and concerns should be expressed toward the formation of a representative position on issues important to our profession. The Annual Meeting provides an opportunity for expression of membership opinion, directly and through your delegate and trustee representatives. The MMA exists to serve your needs as a practicing physician. It can serve you best with input from all members.

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S.V. Thorson, M.D.
Chairman
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(Continued from page 308)

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MAKES SENSE



fore prescribing, see complete prescribing ormation in SK&F Co. literature or PDR. brief summary follows:

Warning
This drug is not indicated for initial therapy of edema or hypertension. Edema or hypertension requires therapy titrated to the individual. If this combination represents the dosage so determined, its use may be more convenient in patient management. Treatment of hypertension and edema is not static, but must be reevaluated as conditions in each patient warrant.

dications: When the combination represents dosage determined by titration: Adjunctive rapy in edema associated with congestive art failure, hepatic cirrhosis, the nephrotic ndrome. Corticosteroid and estrogen-induced ema, idiopathic edema; hypertension, when potassium sparing action of triamterene is rranted. (See Box Warning.) Routine use of uretics in healthy pregnant women is inappriate; they are indicated in pregnancy only en edema is due to pathological causes.

ntraindications: Further use in anuria, gressive renal or hepatic dysfunction, perkalemia. Pre-existing elevated serum assium. Hypersensitivity to either comnent or other sulfonamide-derived drugs.

rnings: Do not use potassium supplements, tary or otherwise, unless hypokalemia develops dietary intake of potassium is markedly impaired. upplementary potassium is needed, potassium lets should not be used. Hyperkalemia can occur, and s been associated with cardiac irregularities. It is re likely in the severely ill, with urine volume s than one liter/day, the elderly and diabetics h suspected or confirmed renal insufficiency. iodically, serum K^+ levels should be determed. If hyperkalemia develops, substitute a azide alone, restrict K^+ intake. **Associated dened QRS complex or arrhythmia requires mpt additional therapy.** Thiazides cross the cental barrier and appear in cord blood. Use pregnancy requires weighing anticipated efits against possible hazards, including al or neonatal jaundice, thrombocytopenia, other erse reactions seen in adults. Thiazides appear and triamterene may pear in breast milk. If their use is essential, the patient should stop sing. Adequate information on use in children is not available.

cautions: Do periodic serum electrolyte determinations (particularly portant in patients vomiting excessively or receiving parenteral fluids). Periodic BUN and serum creatinine determinations should be made, especially in the elderly, diabetics or those with suspected or confirmed renal insufficiency. Watch for signs of impending coma in severe liver disease. If spironolactone is used concomitantly, determine serum K^+ frequently; both can cause K^+ retention and elevated serum K^+. Two deaths have been reported with such concomitant therapy (in one, recommended dosage was exceeded, in the other serum electrolytes were not properly monitored). Observe regularly for possible blood dyscrasias, liver damage, other idiosyncratic reactions. Blood dyscrasias have been reported in patients receiving triamterene, and leukopenia, thrombocytopenia, agranulocytosis, and aplastic anemia have been reported with thiazides. Triamterene is a weak folic acid antagonist. Do periodic blood studies in cirrhotics with splenomegaly. Antihypertensive effect may be enhanced in post-sympathectomy patients. Use cautiously in surgical patients. The following may occur: transient elevated BUN or creatinine or both, hyperglycemia and glycosuria (diabetic insulin requirements may be altered), hyperuricemia and gout, digitalis intoxication (in hypokalemia), decreasing alkali reserve with possible metabolic acidosis. 'Dyazide' interferes with fluorescent measurement of quinidine.

Adverse Reactions: Muscle cramps, weakness, dizziness, headache, dry mouth; anaphylaxis, rash, urticaria, photosensitivity, purpura, other dermatological conditions; nausea and vomiting, diarrhea, constipation, other gastrointestinal disturbances. Necrotizing vasculitis, paresthesias, icterus, pancreatitis, xanthopsia and, rarely, allergic pneumonitis have occurred with thiazides alone.

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(potassium gluconate)

Kaon® Tabs
(potassium gluconate)

BRIEF SUMMARY
Kaon Tablets/Kaon Elixir

KAON® (potassium gluconate) TABLETS

Description: Each sugar-coated tablet supplies 5 mEq. of elemental potassium (as potassium gluconate 1.17 Gm.). Kaon Tablets are sugar coated, not enteric coated, which favors dissolution in the stomach and absorption before reaching the small intestine where the lesions with enteric potassium chloride have occurred. The sugar coating merely adds to palatability and ease of swallowing, not to delay absorption as does the enteric coating.
Indications: Oral potassium therapy for the prevention and treatment of hypokalemia which may occur secondary to diuretic or corticosteroid administration. It may be used in the treatment of cardiac arrhythmias due to digitalis intoxication.
Contraindications: Severe renal impairment with oliguria or azotemia, untreated Addison's disease, adynamia episodica hereditaria, acute dehydration, heat cramps and hyperkalemia from any cause.
Warning: There have been several reports, published and unpublished, concerning nonspecific small-bowel lesions consisting of stenosis, with or without ulceration, associated with the administration of enteric-coated potassium tablets alone or when they are used with nonenteric-coated thiazides or certain other oral diuretics. These small-bowel lesions have caused obstruction, hemorrhage and perforation. Surgery was frequently required and deaths have occurred. Available information tends to implicate enteric-coated potassium salts, although lesions of this type also occur spontaneous
Therefore, coated potassium-containing fo
lations should be administered only when
cated and should be discontinued immedia
abdominal pain, distention, nausea, vomiti
or gastrointestinal bleeding occur. Coated p
sium tablets should be used only when ade
dietary supplementation is not practical.
Precautions: In response to a rise in the co
tration of body potassium, renal excretion
ion is increased. With normal kidney func
it is difficult, therefore, to produce potassi
intoxication by oral administration. Howe
potassium supplements must be administe
with caution, since the amount of the defic
or daily dosage is not accurately known. F
quent checks of the clinical status of the pa
and periodic ECG and/or serum potassium
levels should be made. High serum concen

Time is the test of all things



; of potassium ion may cause death through
iac depression, arrhythmias or arrest. This
should be used with caution in the presence
rdiac disease.
hypokalemic states, especially in patients
salt-free diet, hypochloremic alkalosis is a
ibility that may require chloride as well as
ssium supplementation. In these circum-
ces, Kaon (potassium gluconate) should be
lemented with chloride. Ammonium chlo-
is an excellent source of chloride ion (18.7
. per Gram), but it should not be used in
nts with hepatic cirrhosis where ammonium
are contraindicated. Other sources for
ride are sodium chloride and Diluted
rochloric Acid, U.S.P.
should also be kept in mind that ammonium
cation exchange resin, sometimes used to
hyperkalemia, should not be administered to patients with hepatic cirrhosis.

Adverse Reactions: Nausea, vomiting, diarrhea and abdominal discomfort have been reported. The symptoms and signs of potassium intoxication include paresthesias of the extremities, flaccid paralysis, listlessness, mental confusion, weakness and heaviness of the legs, fall in blood pressure, cardiac arrhythmias and heart block. Hyperkalemia may exhibit the following electrocardiographic abnormalities: disappearance of the P wave, widening and slurring of QRS complex, changes of the S-T segment, tall peaked T waves, etc.

Overdosage: Potassium intoxication may result from overdosage of potassium or from therapeutic dosage in conditions stated under "Contraindications." Hyperkalemia, when detected, must be treated immediately because lethal levels can be reached in a few hours.

KAON® (potassium gluconate) ELIXIR

Description: Each 15 ml. (tablespoonful) supplies 20 mEq. of elemental potassium (as potassium gluconate, 4.68 Gm.) with saccharin and aromatics. Alcohol 5%.

Indications: See Kaon Tablets.

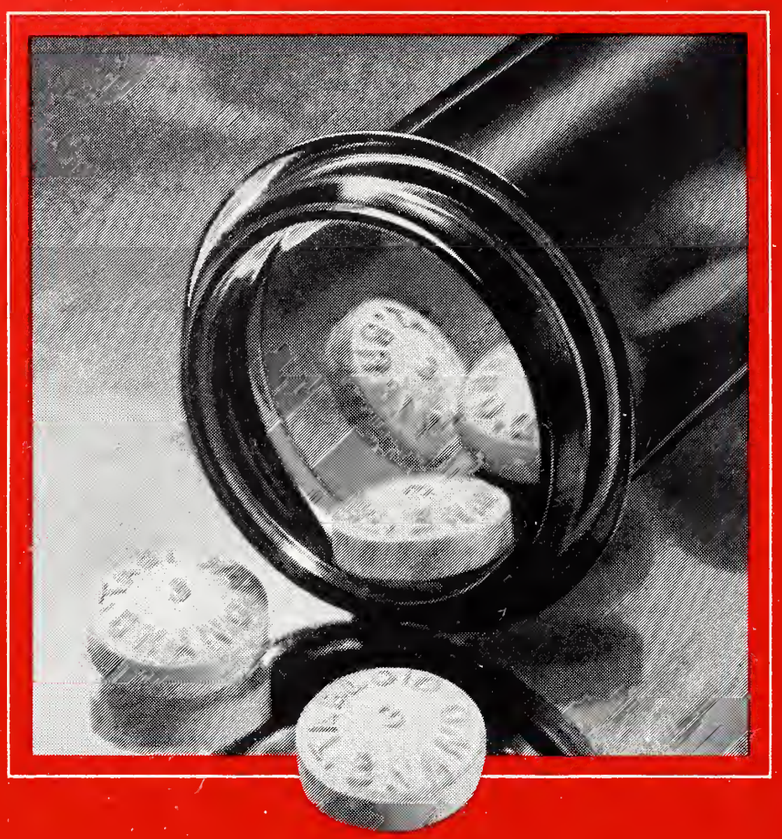
Precautions: See Kaon Tablets.

In hypochloremic alkalosis, potassium replacement with potassium chloride (e.g., Kaochlor® 10% Liquid) may be more advantageous than with other potassium salts.

Adverse Reactions: See Kaon Tablets.

Overdosage: See Kaon Tablets.

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Blood Transfusions

JEFFREY McCULLOUGH, M.D.*

Dr. Jeffrey McCullough:

Whole blood is stored under controlled conditions, at 1-6°C for 21 days. The 21 day shelf life was established in the late 1940s when anticoagulant solutions were being developed and it is based on red cell survival. Thus, whole blood is stored under conditions which are ideal for the preservation of red cells and not ideal for other components of whole blood, such as platelets, Coagulation Factors V and VIII. Recent trends in Blood Banking involve separation of whole blood into components and storage under conditions which are ideal to preserve that specific component. The question is often asked, "Why go to all that work to take the blood apart and store components individually when most patients are going to need more than one component anyway and it must be put back together again in the patient?" There are some good reasons for doing this. Most patients do not need all of the components in whole blood and if so, they usually do not need them in the proportions in which components exist in whole blood. For instance, patients who are thrombocytopenic and anemic often do not need Factor VIII or Factor V. By separating these components, the coagulation factors are available for other patients such as hemophiliacs. Another advantage of blood component therapy is that all components are often not available in stored whole blood, so that if a patient needs red cells, clotting factors and platelets, it is quicker and easier to use stored platelets, red cells and frozen plasma than to find fresh whole blood, especially at unusual hours. Because of increasing Food and Drug Administration regulation and complexity of laboratory testing, the amount of time involved before fresh whole blood can be made available to the patient is six to eight hours. However, using blood component therapy the donor can come to the Blood Bank at his convenience and we can collect the blood, separate it into components and store each component under ideal conditions. We can send a unit of packed cells, 10 or 15 cryoprecipitates and four to six units of platelets to the ward 30-40 minutes after it is ordered. Thus, storing blood components separately, not as whole blood, we can actually have more blood products more readily available to patients.

Packed Red Blood Cells

Transfusions of chronically anemic patients not experiencing acute blood loss should be carried out with packed cells. This could include anemic post-op patients no longer experiencing blood loss.

The biggest area of discussion and disagreement between the blood bankers, surgeons and anesthesiologists is if there is a role for packed cells in the operating room. Many patients can lose up to one liter of blood during surgery and do quite well with no blood replacement.[1,2,3] In practice, I believe most physicians attempt to replace the amount of blood lost by the patient. I suggest that the first two units of blood for routine surgery should be packed cells.[4] Early in the operation when the patient should be fairly stable and there is blood loss up to 1000 ml, it is replaced by packed red cells and saline. No further transfusions may be necessary. However, if blood loss continues it may be replaced with whole blood.

It is not necessary to establish that packed red cells are better for the patient than whole blood, only that they are no more hazardous. If no more hazardous, the overall blood supply is much more effectively utilized by transfusing packed red cells. Every transfusion of whole blood that could be packed red cells deprives some other patient of platelets or coagulation factor concentrate or some other blood component.

Dr. Roby Thompson:

Are you suggesting that if you do not replace everything you lose, you replace what you need to replace? For instance, if you think you are going to lose four units of blood, we should set up the first two units as packed cells and let them start infusing the cells early. Then if we keep losing blood, we should use whole blood thereafter?

A Physician:

In total hip replacements, when patients get behind in blood volume we seem to have a greater problem with the monomer in the cement we use dropping the blood pressure, because the monomer is probably a peripheral vasodilator. Would you prefer to maintain blood volumes with fresh frozen plasma and after the surgery use packed red cells rather than whole blood through the case?

*Department of Laboratory Medicine and Pathology University of Minnesota, Minneapolis.

Combined Teaching Rounds, Department of Orthopaedic Surgery, University of Minnesota, David S. Bradford, M.D., Editor.

Dr. McCullough:

It is safer for the patient and preserves blood components. In general I am suggesting that: (1) We overuse blood; some transfusions are unnecessary. (2) In surgery, it should be possible to use at least a few more packed red cells. An example of how transfusions can be reduced is shown in recent studies of patients undergoing total hip replacement.[5,6] Preoperatively, the physicians estimated the volume of blood loss that the patient could sustain before the hemoglobin would fall to 10 mgs/dl. In one group this blood loss was replaced with albumin and in a second group with plasma. There was a third group that received blood replacement according to usual procedures. Essentially the patient was hemodiluted down to about 10 gms/dl before red cell transfusions were started. There was no difference in the length of hospitalization, blood loss during surgery and complications post-op, among these three groups. However, the number of units of blood used during surgery was reduced by about 33 percent in the groups receiving albumin or plasma.

Dr. David Bradford:

Jerry Moss[7] has proposed frequently that patients be resuscitated with packed red cells and an electrolyte solution rather than whole blood. How quickly can the packed red cells be infused? Also, if a microaggregate filter is used, isn't the flow rate further reduced?

Dr. McCullough:

Many surgeons use packed red blood cells or their equivalent in the treatment of hypovolemic shock. Also, many surgeons use frozen red cells for open heart surgery, renal transplantation or orthopedic procedures requiring many units of blood. Frozen red cells have the same volume and blood volume expanding capabilities as packed red cells, however, many of these same physicians refuse to use packed red blood cells during these operative procedures.

Rapid infusion of packed red blood cells is an occasional problem but should not be. Needles or catheters of 19 gauge or larger should be used for infusion. A particular blood filter is available for use with packed red cells. The pore size of the filter is standard, but the total size of the filter is larger than usual, thus allowing faster flow rates through the filter. The bag of packed red cells should be mixed periodically during infusion because as the blood settles, the hematocrit may reach 90% at the bottom (outlet) portion of the bag.

A Physician:

Why don't you reconstitute the packed red cells with some saline or lactated Ringers so that they would be easier to infuse?

Dr. McCullough:

Saline could be used but we do not. Once the unit has been entered it outdates in 4 hours, because of the chance of bacterial contamination. Saline can be added in the operating room however. Using a Y-set, pinch it off below the filter and run saline into the drip chamber and back up into the unit of packed cells. Then close the saline and open the line below the filter to infuse the blood. Lactated Ringers should not be used for this purpose because it contains calcium which will cause the unit to clot.

I would like to emphasize that the use of packed red cells in surgery does not mean just packed cells. This should be supplemented with saline or albumin. These patients do not die because of a lack of red cells. The problem is volume and so albumin or saline are at least as important as red cells. We have focused on whole blood versus packed red cells and it is not necessarily the red cell that needs to be replaced in these situations.

The next consideration is microaggregates. Microaggregates are 20-80 micron particles, probably composed of clumps of old leukocytes, platelets and some fibrin. These microaggregates develop as blood is stored. The ordinary blood administration set has a filter of 170 microns pore size, thus allowing smaller particles to pass. Microaggregates have been implicated in shock lung[8] however, the true clinical role of microaggregates has not been established.[9] Regardless, microaggregate filters are being used. They are not necessary for most transfusions. Fresh whole blood or platelets should never be infused through a microaggregate filter because the filter removes platelets. If the filters are indicated, it is in massive transfusions, such as more than ten units of blood in an adult.

A Physician:

What is the value of frozen blood and autologous transfusion for orthopedic surgical patients?

Dr. McCullough:

My remarks on frozen blood apply to all clinical situations. Frozen blood is essentially pure red cells resuspended in a balanced electrolyte solution. During the washing and deglycerolizing process, all the platelets, leukocytes, plasma, microaggregates, fibrin strands, etc., are removed. Frozen red cells have some similarities to packed red cells (Table). This makes frozen red cells ideal for prevention of allergic reactions to plasma and febrile reactions to leukocytes.

TABLE

Comparison of Characteristics of Frozen Red Cells, Packed Red Cells and Whole Blood

	Whole Blood	Packed Red Cells	Frozen Red Cells
Volume (ml)	517.5	300	314
Hematocrit (%)	40	70	70
Hemoglobin (Total gms)	60	60	56.6
Plasma (ml)	250	78	0
Plasma protein (total gms)	48.75	36	0
Plasma sodium (total meq)	45	15	13.6
Plasma potassium (total meq)	15	5	0.7
Plasma citrate (total ml)	67.5	22	0
Plasma hemoglobin (total mgm)	125	40	182
Plasma antigens	Maximal	Minimal	Absent
Plasma antibodies	Maximal	Minimal	Absent

Dr. Bradford:

Do you feel there is much benefit to be gained by autologous transfusions, particularly with the low risk of hepatitis in this part of the country?

Dr. McCullough:

Of course each unit of the patient's own blood used reduces the hepatitis risk, but I believe the benefits of autologous transfusion are sometimes overemphasized. The clinician must monitor the patient carefully between phlebotomies to insure that continued removal of blood is safe. Usually the total blood needs of the patient are not met with autologous blood. Four or more units of homologous blood are often required.

A Physician:

I agree with you, however when the surgeon knows that there are only two or three units of the patient's blood available, they try very hard to avoid using more. There may be a significant decrease in blood loss because of improved technique. I think that is good, because it will improve our technique and require less blood.

A Second Physician:

One of my concerns about autologous transfusions is that we are unable to do it in small children, yet these are the very patients who lose small volumes of blood.

Dr. McCullough:

We now can collect small volumes from them also. Until recently, there were no small collection containers. The ratio of anticoagulant to blood is critical so that the size of bag and its content of anticoagulant is critical. Recently a container has become available which makes it possible for us to collect units of blood of approximately 150 ml.

Blood transfusion, like other aspects of medicine, has become increasingly complex. It is only through discussions such as we are having today that we can work together to provide the most benefit for the patient.

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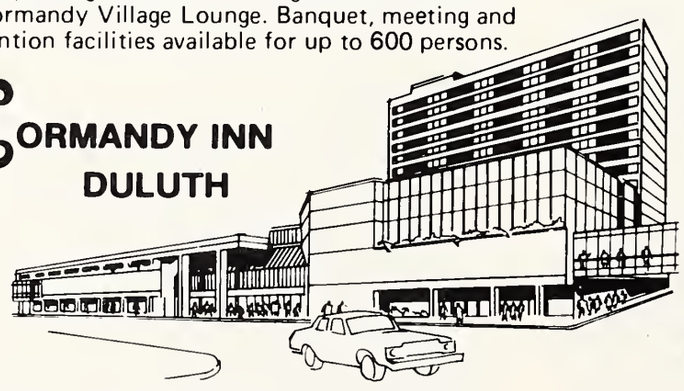
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Indications: Although the principal indication for cloxacillin sodium is in the treatment of infections due to penicillinase-producing staphylococci, it may be used to initiate therapy in such patients in whom a staphylococcal infection is suspected. (See Important Note below.)

Bacteriologic studies to determine the causative organisms and their sensitivity to cloxacillin sodium should be performed.

Important Note: When it is judged necessary that treatment be initiated before definitive culture and sensitivity results are known, the choice of cloxacillin sodium should take into consideration the fact that it has been shown to be effective only in the treatment of infections caused by pneumococci, Group A beta-hemolytic streptococci, and penicillin G-resistant and penicillin G-sensitive staphylococci. If the bacteriology report later indicates the infection is due to an organism other than a penicillin G-resistant staphylococcus sensitive to cloxacillin sodium, the physician is advised to continue therapy with a drug other than cloxacillin sodium or any other penicillinase-resistant semi-synthetic penicillin.

Recent studies have reported that the percentage of staphylococcal isolates resistant to penicillin G outside the hospital is increasing, approximating the high percentage of resistant staphylococcal isolates found in the hospital. For this reason, it is recommended that a penicillinase-resistant penicillin be used as initial therapy for any suspected staphylococcal infection until culture and sensitivity results are known.

Cloxacillin sodium is a compound that acts through a mechanism similar to that of methicillin against penicillin G-resistant staphylococci. Strains of staphylococci resistant to methicillin have existed in nature and it is known that the number of these strains reported has been increasing. Such strains of staphylococci have been capable of producing serious disease, in some instances resulting in fatality. Because of this, there is concern that widespread use of the penicillinase-resistant penicillins may result in the appearance of an increasing number of staphylococcal strains which are resistant to these penicillins.

Methicillin-resistant strains are almost always resistant to all other penicillinase-resistant penicillins (cross-resistance with cephalosporin derivatives also occurs frequently). Resistance to any penicillinase-resistant penicillin should be interpreted as evidence of clinical resistance to all, in spite of the fact that minor variations in *in vitro* sensitivity may be encountered when more than one penicillinase-resistant penicillin is tested against the same strain of staphylococcus.

Contraindications: A history of a previous hypersensitivity reaction to any of the penicillins is a contraindication.

Warning: Serious and occasionally fatal hypersensitivity (anaphylactoid) reactions have been reported in patients on penicillin therapy. Although anaphylaxis is more frequent following parenteral therapy it has occurred in patients on oral penicillins. These reactions are more apt to occur in individuals with a history of sensitivity to multiple allergens.

There have been well documented reports of individuals with a history of penicillin hypersensitivity reactions who have experienced severe hypersensitivity reactions when treated with a cephalosporin. Before therapy with a penicillin, careful inquiry should be made concerning previous hypersensitivity reactions to penicillins, cephalosporins, and other allergens. If an allergic reaction occurs, the drug should be discontinued and the patient treated with the usual agents, e.g., pressor amines, antihistamines, and corticosteroids.

Safety for use in pregnancy has not been established.

Precautions: The possibility of the occurrence of superinfections with mycotic organisms or other pathogens should be kept in mind when using this compound, as with other antibiotics. If superinfection occurs during therapy, appropriate measures should be taken.

As with any potent drug, periodic assessment of organ system function, including renal, hepatic, and hematopoietic, should be made during long-term therapy.

Adverse Reactions: Gastrointestinal disturbances, such as nausea, epigastric discomfort, flatulence, and loose stools, have been noted by some patients. Mildly elevated SGOT levels (less than 100 units) have been reported in a few patients for whom pretherapeutic determinations were not made. Skin rashes and allergic symptoms, including wheezing and sneezing, have occasionally been encountered. Eosinophilia, with or without overt allergic manifestations, has been noted in some patients during therapy.

Usual Dosage: Adults: 250 mg. q.6h.

Children: 50 mg./Kg./day in equally divided doses q.6h. Children weighing more than 20 Kg. should be given the adult dose. Administer on empty stomach for maximum absorption.

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Environmental Health

Environmental Pathology, Target Environmental Cancer

VINCENT F. GARRY, JR., M.D.*

Environmentally related disease is obviously with us. Emergence of environmental pathology as a discipline is required to meet the challenge.

HISTORICALLY, ENVIRONMENTAL pathology can be traced to the use of technology to solve human problems. For example, incorporating lead into Greco-Roman technology brought about periodic epidemics of lead poisoning. Even then, physicians made the association between occupational exposure, symptoms, and concluded with the lead intoxication diagnosis.[1]

Today, lead poisoning in children and adults is not totally uncommon. Low doses of lead in the developing child can be directly associated with varying degrees of mental retardation.[2] Inadequately fired ceramic drinking vessels have become a notorious source of lead intoxication in adults.[3,4] Yet lead and lead compounds are emanately useful. The euphemism, "For every use there is a consequence; some may be untoward", is quite pertinent.

Linkage steps for lead intoxication are clearly established. Each point in the environmental chain is known, and the hazard has been identified. For many chemicals in present use the situation is not entirely clear. One particularly difficult situation is the use of nitrite preservatives. We know that nitrites can be converted to nitrosamines, potent animal carcinogens.[5] One biologic mechanism involves the synthesis of nitrosamines from nitrites by the bacterial flora of the gastrointestinal tract.[6] Physiochemically, the same process can be accomplished by frying bacon.[7] In this case, volatile nitrosamines are released into the atmosphere. Still, these substances are not proven human carcinogens. Since these preservatives are in such widespread use, perhaps no appropriately controlled study is feasible in man. In either case, it is not ethically desirable to dose individuals with a potential human carcinogen.

Tumorigenesis

The most prominent question posed in environmental pathology deals with the hazard imposed by actual and potential environmental carcinogens. It is estimated that 60% of all human cancers are due to environmental agents.[8] Of necessity, surveillance of the human environment for carcinogens should be expected and promoted. Often we of the medical community have seen these kinds of commitments made and fall short of the goals set. The present situation is not dissimilar.

In a recent study by the World Health Organization, the incidence of cancer was computed for 25 countries. Data derived from that study showed an almost logarithmic increase in the overall incidence of all cancers per 100,000 population beyond age 40.[9] These demographic data illustrate the fundamental latency period for the onset of cancer in general. Accordingly, it may be twenty years or more from an initial mutagenic event to the first appearance of a neoplasm.

Experimentally, the latency period for cancer presents an expensive and time consuming obstacle.[10] Animal experiments require years to complete. High doses of the suspected carcinogen are used. In this fashion, the latency period may be reduced and the incidence of neoplasms may be increased. In effect, a dollar cost saving is achieved. In the conduct of these kinds of studies, one must also consider life span, metabolism, and tumor susceptibility of the test animal. Bearing these factors in mind, Higginson[11] estimated that the world capability for the identification of carcinogens amounts to 500 chemicals per year.

On the average, the cost of examining one suspected carcinogen is approximately 500,000 dollars spread over a three year period. Despite this outlay of funds, one cannot guarantee that the material is or is not carcinogenic for man. However, the weight of evidence shows that most identified carcinogens in man are carcinogenic for animals. One notable exception is trivalent arsenic which is carcinogenic for man.[12] It has yet to be found carcinogenic for animals. Because of differences in metabolism, a dose carcinogenic for animals may not be extrapolated directly to man. These factors alone, species differences and latency period, make it extremely difficult to determine environmentally safe levels for a given carcinogen.

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These factors currently serve as an ignition point in the controversy surrounding the identification of a threshold for an observed carcinogenic effect. Data derived from chemical carcinogen studies suggest that a threshold effect is dependent on dose, length of chemical exposure, species, and lifespan of the test animal. Radiation exposure data affirms no zero level effect after even a single low level exposure. Both the radiation effect and chemical carcinogen studies are cause for concern. They clearly indicate that environmental carcinogen testing cannot state environmentally safe levels for a given carcinogen. However, it may be possible to determine minimal risk levels.

Whether an increased risk of cancer for a given population set exposed is acceptable may be a moot point. For example, smoking is statistically associated with an increased incidence of lung cancer. A subset of the population appears willing to accept that risk.[14]

Legislative Imperative

Cognizance of the cost-benefit ratio of technology is growing. We have begun to see that for every technologic gain there is a cost. Congress has enacted legislation that identifies environmental problem areas. In 1938 the Federal Food, Drug and Cosmetic Act placed a number of materials under government control. It required that drugs be tested before they were marketed. In 1973 Congress put forward the Consumer Product Safety Act requiring among other things that the public be protected against unreasonable risks of injury associated with consumer products. Finally, on October 11, 1976, the Toxic Substances Control Act became law. It stated: (1) Adequate data should be developed with respect to the effect of chemical substances and mixtures on health and the environment. (2) Adequate authority should exist to regulate chemical substances and mixtures which present an unreasonable risk of injury to health or the environment. It is apparent by historical and legislative fiat that laboratory evaluation of potential and actual environmental health hazards is advocated.

Innovations — 1970s

Because of these shortfalls, new innovations in laboratory testing began in the late 1960s. It is now possible to screen carcinogens in a rapid, cost effective manner. Each of the assay systems now available addresses the problem of carcinogenesis in some unique fashion. The properties of carcinogens are defined in terms of primary DNA damage,[15] point mutation,[16] and neoplastic transformation[17] in cell culture. Most of the assay systems employ either microbial or mammalian cells *in vitro*. To activate procarcinogens, liver microsomal preparations are used.[18] Alternatively, mammalian host mediated assays accomplish the same effect on a broader scale. Short term *in vivo* methods are also effectively used. All of the methods provide rapidity of assessment and significant cost saving. To reduce and eventually eliminate false negative results, the assays are grouped together as a battery of tests.[19,20]

Current Trends

A primary screening test battery* should include: (1) the salmonella typhimurium revertent mutagenesis system,[21] (2) bone marrow micronucleus test[22] (chromosomal damage)[23] and (3) the mammalian cell transformation assay.[24] Among the most ingenous of the assays, the salmonella systems developed by B. Ames has demonstrated a 90% positive correlation with 175 known carcinogens tested.[25] The bone marrow test system put forward by Schmidt is a 24 hour *in vivo* test used to demonstrate cytogenetic damage. With appropriate qualification, the data can be translated to tangible genetic damage in man. Some classes of known carcinogens, chlorinated aromatics, nitrogenous aromatics and particulates† are not detected by the salmonella assay but are for the most part detected by the mammalian cell transformation assay originated by Di Paolo.[26] Other chemicals, including several cancer chemotherapeutic agents, are positive by the transformation assay at dose levels equivalent to serum concentrations of the drugs.[27]

Currently, these screening tools are used as a first phase evaluation of possible carcinogens.[29] False positives may arise but can be eliminated with long term testing in animals.[30] False negatives have been found in any one system. The combination of the salmonella test system and the mammalian cell transformation assay can capture at least 77% of a wide variety of carcinogens.[31] A negative result can be confirmed with long term testing.

In the context of the foregoing approach, long term testing is justified when the economic and social benefits outweight alternatives to the test material. To reach the bounds of our chemical environment, the risk of a false negative need be accepted. Reduction of that risk is the focus of present ongoing research efforts.

It would seem that laboratory screening and identification of carcinogenic hazards may prevent future societal costs. For the present, documentation for a number of environmental and occupational carcinogenic hazards is available for some materials. These data form baseline estimates of present risks.

*See appendix for details.

†Presently, the particulate asbestos is under study in several laboratories.

Environmental Disease and Minnesota

There is regional variation in the occurrence of cancer in this country. In continuing studies, the cancer incidence by county has been shown to follow a geographic distribution.[32,33] Typical areas of increased incidence include the Mississippi delta and the coastal plains of New Jersey, Maryland and Delaware. In Minnesota, the counties in the environs of Duluth show marked increase in reported cancers.

To illustrate the point more fully, let us review the geographic distribution of carcinoma of the stomach and carcinoma of the bladder. The pattern observed for carcinoma of the bladder follows the distribution of the chemical industry.[34] More pertinent; it is well known that bladder cancer is associated with exposure to aniline dyes and rubber products. Etiologically, beta-napthylamine has been identified as the chemical carcinogen. Recently, benzidine has also been implicated as a cause of human bladder cancer.[35]

With respect to cancer of the stomach, ethnic groups eating large amounts of home smoked fish have a higher incidence of this type of cancer.[7] A polycyclic hydrocarbon, benz(a)pyrene[36] isolated from smoked foods is capable of producing neoplasms in rats. In the Duluth area, there is an increased incidence of stomach cancer.[32] The cultural-chemical association is not particularly strong. However, asbestiform fibers have been present in the water supply for a number of years.[38,39,40] Perhaps this may be a more appropriate correlation. Definitive proof one way or another is not yet available.

Other cancer clusters occur within our state. In the Fargo-Moorhead area,[41] an increased incidence of multiple myeloma has been found. No cause effect relationship has been demonstrated.

Parts of Wisconsin serviced by the Marshfield Clinic have shown an unusually frequent occurrence of angiosarcoma of the liver.[42] The tumor is rare, except among workers with documented exposure to polyvinyl chloride.[43] No association with this chemical has been demonstrated in the Wisconsin cases.

Recently, in studies performed by the Minnesota State Department of Health, phenolic components of creosote have been found in the water supply of the communities of Edina and St. Louis Park. The material has been traced to the underground aquifer adjacent to an old creosote plant. The carcinogenic potential of creosote has been adequately demonstrated in man. A component product, benz(a)pyrene, is a well known animal carcinogen. Undoubtedly, this local occurrence is an environmental carcinogen problem and it will be some years hence before its significance is shown.

References will be found on page 340.

Role of Pathology

Laboratory medicine and pathology have a definite role in the assessment of environmentally related cancer. The tools and the techniques of this discipline are the tap roots of the study of environmental disease. Data gathered daily by hospital pathologists can be collated to define the tumor incidence in a given area. Autopsy material can be used to establish trends in the accumulation of toxic materials from environmental sources. More specialized laboratories can carry out toxicant investigation.

Conclusions

The problem of environmentally related cancer is obviously with us. Some initial steps have been taken to develop the proper tools for environmental carcinogen assessment. It is time to use the tools available to prevent or reduce the incidence of environmentally related cancer.

Appendix

Laboratory Tests

I. Salmonella Typhimurium Revertent Mutagenesis System.

Bacteria which are nutritionally dependent on Histidine are employed. A point mutation at the Histidine locus reverts the bacteria to nutritional independence. In this form, colonies are produced in media deficient to Histidine. The number of revertent colonies are proportional to the dose and sensitivity of the bacterial strain.

II. Bone Marrow Micronucleus Test

Chromosomal damage is reflected by the formation of micronuclei in polychromatophilic erythrocytes. Quantitative estimates of chromosomal damage are provided by cytologic examination of the marrow 24 hours after *in vivo* exposure to noxious chemical agents. The phenomenon is dose related. Counts of the number of erythroid cells with micronuclei are simple and add rapidity to the screening process.

III. Mammalian Cell Transformation Assay

Cells derived from mammalian embryonic tissue are exposed to a potential carcinogen *in vitro*. In the presence of a carcinogen, morphologically abnormal colonies are produced. The morphologically transformed cells are injected into a mammalian host species. Confirmation of neoplastic transformation is defined by tumor growth *in vivo*.

Special Article

Admission Health Evaluation of Inmates of a City-County Workhouse

ROBERT A. DERRO, M.D.*

We determined the health status of 491 inmates upon admission to the St. Paul-Ramsey County Workhouse. Commonly encountered problems and identified health needs formed the basis of guidelines subsequently developed for routine health screening.

THE MEDICAL PRESS continues to discuss health care in correctional institutions.[1,2] The American Medical Association,[3] the American Public Health Association,[4] and the National Institute of Law Enforcement and Criminal Justice[5] have formulated health standards for these institutions. However, Goldsmith, in a comprehensive review of the literature,[6] cited the limited nature of prison health care studies to date. In addition, many are skeptical of the value of routine health examinations,[7] and others are saying we must be accountable in health care delivery.[8]

We designed a protocol for determining health problems of inmates being admitted to the St. Paul-Ramsey County Workhouse. The protocol's purpose was to help us develop guidelines for routine admission screening. In a second phase of the study, we have recorded the types and frequencies of health problems encountered in the course of the inmates' sentences. This will be the subject of a later report.

Methods

The St. Paul-Ramsey County Workhouse houses 100 to 150 male inmates. They serve sentences varying from a few days up to one year for mostly non-violent offenses. Between August 1, 1974 and August 31, 1975, there were 1,264 admissions to the facility. Of these, 46 were discharged in less than 24 hours. Seven hundred twenty-seven served sentences of less than 30 days and completed only the health history questionnaire. We administered health history and self-rating depression scale[9] questionnaires to 491 individuals serving sentences of at least 30 days. They also underwent physical and laboratory examinations. The results of the questionnaires and examinations on this latter group of inmates constitute this report.

The mean and median ages of the study group were 27.4 and 23.3 years respectively. The age range was 15-64 years.

The self-administered health questionnaire emphasized an inmate's recent and present health. We did not routinely include funduscopic, rectal, and neurological examinations in the otherwise complete physical examination. Laboratory investigation comprised hemoglobin and/or hematocrit, urinalysis, VDRL, intermediate strength PPD, and in Blacks a test for sickle cell trait. All tuberculin reactors underwent chest Xray examination, except where they related having had an Xray within the past year.

Results

Health History Questionnaire

Table 1 shows the results of the health history and Zung self-rating depression questionnaires. Sixty-seven and six-tenths percent of all inmates related

TABLE 1
Results of Health History and Zung Self-Rating Depression Scale Questionnaires

	Positive Responses
	%
Hospitalization within past year	25.3
Ambulatory care within past year	58.5
Major illness(es)	12.8
Taking prescription medication	11.2
Drug or substance allergy	10.6
"Drug problem"	11.4
"Drinking problem"	36.6
Family history of diabetes	14.9
Family history of hypertension	11.8
Family history of tuberculosis	6.1
Previous positive PPD	7.3
Present symptoms	31.7
Zung Depression Index	44.6

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Supported by a research grant (801D51) from the St. Paul-Ramsey Hospital Medical Education and Research Foundation.

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having been hospitalized or having sought ambulatory care on at least one occasion in the year prior to admission. Fifty-nine and two-tenths percent of these encounters took place at St. Paul-Ramsey Hospital, where the medical records were readily accessible to the author. It was possible in these instances to verify the historical information.

Table 2 lists the reasons for seeking medical care. It reflects a life-style which often includes traumatic incidents, the abuse of alcohol and other drugs, psychiatric problems, and accelerated job mobility.

Inmates related a history of major illness(es) in 71 instances. This history was accurate in 47 (66.2%). We based this conclusion on results of the admission evaluation, additional information which became available, and/or subsequent clinical illness. The most common major illnesses related on admission were epilepsy (N=8), hypertension (8), asthma (7), peptic ulcer (6) and psychiatric disturbance (6).

TABLE 2
Reasons for In-Hospital and Ambulatory Medical Care Within Past Year

	Frequency
Trauma or trauma-related	203
Alcoholism or alcohol-related	59
Psychiatric	53
Pre-employment or military examination	51
Drug abuse	41
Skin disorders	30
Acute or chronic pulmonary disease	28
Seizure disorder	27
Upper respiratory infection	16
Hepatitis	12
Routine examination	11
Cardiac disease	10
Other	262
TOTAL	803

Fifty-five inmates were taking prescription medications on admission. Antibiotics, tranquilizers, analgesics and anti-convulsants comprised the majority of these. Thirty-six inmates related a history of drug allergy. Of these, 27 (75%) attributed it to penicillin, alone or in addition to other drugs. The nonprescribed drugs most commonly abused by inmates were amphetamines, marijuana and related compounds, barbiturates, and heroin.

Family History

A family history of diabetes, hypertension, and/or tuberculosis, was helpful in predicting selected physical or laboratory findings. Five and five-tenths percent of inmates relating a family history of diabetes (N=73) exhibited glucosuria, as compared to 1.0% of subjects with a negative family history (N=418, $P<0.005$*). Corresponding figures for inmates with a positive/negative family history of hypertension and BP$\geq$140/90 mm Hg on examination were 22.4% (N=58) and 9.5% (N=433, $P<0.001$). Thirty-seven and nine-tenths percent of inmates reporting a family history of tuberculosis (N=29) had a confirmed positive PPD, as opposed to 7.7% of subjects with a negative family history (N=457, $P<0.001$).

Depression Index and Symptoms

We demonstrated an association between a positive Zung Depression Index and the presence of symptoms on admission. Thirty-eight percent of inmates with a positive Depression Index (N=216) had at least one symptom on admission, as opposed to 27.2% of inmates with a negative Index (N=268, $P<0.01$). Further, 20.8% of Index-positive subjects had at least one symptom not associated with a relevant physical or laboratory finding, as compared to 13.8% of subjects with a negative Index ($P<0.05$).

Physical Examination

The most common findings on physical examination were dental and/or gingival abnormalities, obesity, abnormalities of the tympanic membrane, dermatologic disorders, and a BP$\geq$140/90 mm Hg (Table 3). In addition to elevated blood pressure and inguinal hernia, the most common significant illnesses† were inflammatory disease of the middle ear with or without associated hearing loss in 14 subjects, alcoholic liver disease in 10, and recent and serious trauma in seven.

TABLE 3
Results of Physical Examination

	Abnormal or Positive
	%
Dental	66.3
Body weight	18.9
HEENT	15.8
Skin	11.5
Blood pressure	11.0
Musculo-skeletal	8.6
Psychiatric	6.6
Anus	6.0
Chest wall and lungs	4.7
Neck	3.3
Abdomen	3.1
Genitalia	3.1
Heart	1.6
Hernia	1.2

*All P values in the text are based on calculations of the Z value of the difference between two sample proportions.

†In designating an illness as "significant", three criteria were considered: the need for prompt formulation of diagnostic and/or therapeutic plan(s), the importance of the physician's and/or inmate's awareness of the illness, and the need for outside consultation.

There were five subjects with an overt affective disorder, four with chronic bronchitis and/or chronic obstructive pulmonary disease, and three with a subcutaneous abscess. There were 23 additional instances of significant illness in one or two inmates each. Diagnosis was delayed in two subjects who had incubating gonococcal urethritis and carcinoma of the esophagus on admission.

The prevalence of definite hypertension (BP≥160/95 mm Hg) was somewhat lower than that reported in much larger state[10] and national[11] surveys (Table 4). The percentages for age-related borderline hypertensive values more closely approximated those of the latter study. Only four of 54 inmates with a borderline or definitely elevated blood pressure had previous knowledge of or had received treatment for it. Three were under treatment at the time of admission to the Workhouse. Eight inmates related hypertension as a major problem on admission. Four of them were found to be hypertensive on examination and none were on treatment. These figures reflect a pattern common to the community at large.*

We paid particular attention to examination for an enlarged liver in the 159 inmates admitting to a "drinking problem." We also percussed liver dullness in 84 subjects from this group. The liver was enlarged to palpation and percussion in only two inmates. In seven additional subjects liver dullness exceeded by at least one centimeter the height-related averages determined by Castell et al.[12]

*The "½x½x½ Formula" has been used to describe the problem: "One-half of those with hypertension do not know that they have this disease; of the half that know that they have hypertension, half are not currently under physicians' care for it; and of those aware of their hypertension and under treatment, half are not under adequate blood pressure control".[10]

Symptom Follow-up

Figure 1 summarizes the results of symptom investigation. We demonstrated a relevant physical finding in 41.4% of all symptoms. Twelve and six-tenths percent occasioned diagnosis of a significant illness. Except in the two inmates with severe depression, these illnesses were not of immediate, life-threatening importance.

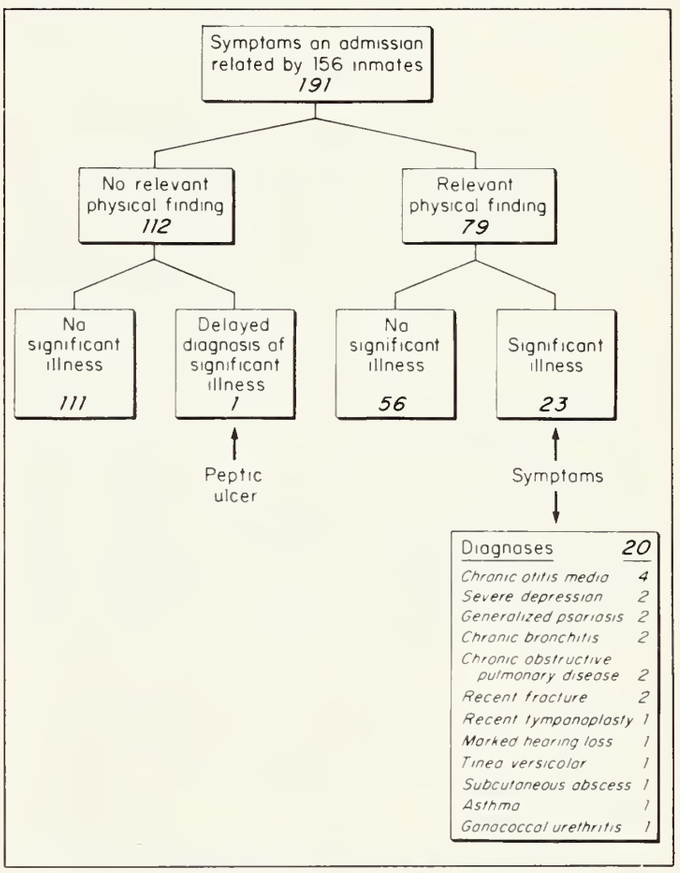


Fig. 1—Evaluation of Symptoms on Admission.

TABLE 4
Results of Blood Pressure Recording and Comparison with State and National Surveys

	BP≥160/95		Minnesota Department of Health Study[10]	National Health Survey[11]
Age	Number	%	%	%
18-24	1/272	0.4	3.3	1.7
25-34	3/108	2.8	8.4	4.8
35-44	8/71	11.3	13.4	13.5
45-54	3/28	10.7	21.9	18.3
	160/95 > BP ≥ 140/90			
Age	Number	%		
18-24	15/272	5.5		10.9
25-34	7/108	6.5		11.9
35-44	8/71	11.3		14.2
45-54	6/28	21.4		17.7
55-64	3/11	27.3		27.5

Laboratory Examination

Table 5 summarizes the results of laboratory investigation. The prevalence of sickle cell trait is higher than an expected rate of 8%.[13] One inmate had a hematocrit less than 30% and had had obvious gastrointestinal blood loss. Two subjects had hematocrits between 30 and 35%, one of whom had alcoholic liver disease. We had not established a cause for anemia in the other by the time of discharge.

We repeated the urinalysis in 39 of the 82 inmates in whom initial examination had revealed pyuria, glucosuria, proteinuria, or hematuria. In 29 instances the repeat test was negative or less abnormal than the initial examination. Further follow-up, consisting of urine culture in 15, fasting blood sugar in four, and extensive urologic investigation in one, revealed no abnormal results.

One of five inmates with a positive VDRL and FTA-absorption was not known to another health care facility. We established adequacy of prior treatment for syphilis in the other four after admission.

TABLE 5
Results of Laboratory Investigation

	Examination Positive or Abnormal
	%
Microscopic pyuria	13.4
Sickle cell test (N=61)	13.1
Hematocrit/hemoglobin	5.7
PPD	1.6
Urine sugar (qualitative, non-diabetics)	1.2
Urine protein (qualitative)	1.2
VDRL/FTA-absorption	1.0
Microscopic hematuria	0.8

Tuberculin Reactivity

Figure 2 shows the tuberculin reactivity in 486 inmates. These data are based in part on a constantly updated file of PPD reactions in inmates admitted to this facility over the past several years. We noted frequent discrepancies between inmate-related histories of positive (or negative) tuberculin reactivity and the results on file of previous PPDs. Thirty-three of 43 inmates with known or confirmed previous positive PPDs underwent chest Xray examinations. In 11 instances, the Xray was indicative of previous but inactive tuberculosis. In the remaining 22 inmates, and

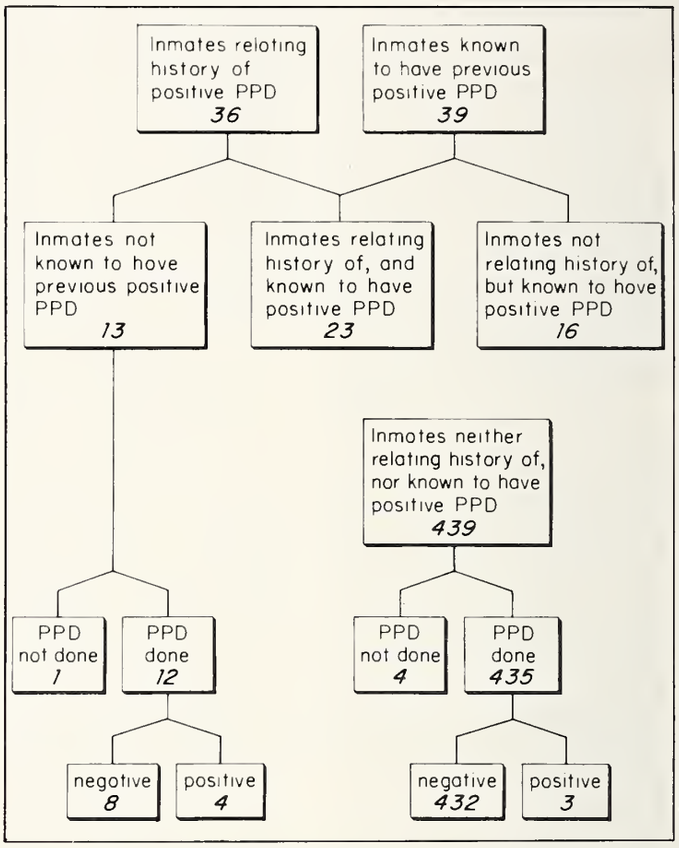


Fig. 2—Tuberculin Reactivity in 491 Inmates.

TABLE 6
Comparison of Mean Ages in Groups With and Without Selected Positive Screening Results

	Negative/Normal		Positive/Abnormal	
	N	Mean Age	N	Mean Age
Significant illness by physical examination	418	26.9	68	31.2*
Confirmed history of major illness	446	26.8	45	33.4**
Blood pressure ≥ 140/90 mm Hg	437	26.4	54	35.3**
PPD	440	25.9	46	41.3**
Other laboratory tests#	467	27.1	20	35.0***
Composite†	324	24.9	159	32.6**

*P < 0.05, based on a 2-tailed Student's t-test.
**P < 0.001.
***P < 0.005.
#Hematocrit < 35%, glucosuria, microscopic hematuria, positive VDRL/FTA-absorption.
† Total of individual subjects from above groups.

in the three subjects with newly established positive PPDs, the Xray was negative for previous or active tuberculosis.

Influence of Age on Screening Results

Table 6 shows the degree to which certain positive screening results were concentrated among older inmates. The differences between mean ages in the negative and positive groups are statistically significant.

Discussion

Lay and scientific authors often assume that individuals confined in correctional institutions commonly enter in poor health, suffering from a number of undetected illnesses. They often attribute this, at least in part, to underutilization of medical care services. However, the data from this study indicate a considerable degree of accessibility to health care services by inmates. Twenty-five and three-tenths percent of inmates related at least one hospitalization in the year prior to their admission. This far exceeds the average of 8.5% reported in the 1974 National Health Survey for the male population aged 17-64.[14] Inmates related a history of 527 ambulatory occasions of service for an average of 1.1 physician visits/inmate/year. This rate is lower than those reported for males of comparable ages in the 1974 Health Interview Survey (3.9)[15] and the National Ambulatory Medical Care Survey (2.6).[16] Various exclusions (and inclusions) in these surveys probably account for part of these differences. It may also reflect the crisis-oriented care which these individuals often receive.

It is difficult to compare disease prevalence rates in inmates of correctional institutions with rates in the general population. There is a paucity of methodologically similar and reliable studies in both settings. The state and national surveys on hypertension[10,11] are an exception to this. Hypertension occurred in the subjects of this study at a rate comparable to that of the general population. A careful study carried out by Gunn and Fenton[17] indicated a higher prevalence of epilepsy in British prisons. The 16.3 per thousand rate in this study is more than twice that reported in the population aged 20-39 in Rochester, Minnesota.[18] Thus, the same may be true of American prisons. However, for this and other problems, it is frequently necessary to rely on inmate-related histories alone. This hinders determination of accurate prevalence rates within such institutions.

In 1962, Whalen and Lyons reported overall and new active tuberculosis prevalence rates in a county facility of 19.5 and 7.3 per thousand.[19] However, a more recent study in New York City correctional institutions revealed a prevalence rate of 1 per thousand for previously unknown active tuberculosis.[20] This is identical to the rate for active tuberculosis in a national survey conducted in 1970.[21] There was an even lower prevalence rate of 0.06 per thousand for males in Minnesota in 1975.* This would explain our failure to detect a single new active case in 491 inmates. Our 9.5% rate of tuberculin reactivity is less than the 17.4% rate reported in a previously cited study.[20] It is, however, more than twice the rate found in white, lifetime one-county Naval recruits from Minnesota in 1958 to 1964.[22] We noted identical reaction rates of 0.7% in 2,918 adult employees of the Ramsey County school system tested in 1975† and in the 435 inmates who were not known to have a positive PPD on admission.

We now emphasize certain components of the admission health screening program. We include specific reference to a past history of middle ear infections and hearing loss on the health questionnaire. We routinely record body weight and blood pressure and note the condition of the teeth and gingiva in each inmate. The age of the inmate, his length of sentence, the presence of symptoms on admission, and relevant information on the health questionnaire dictate the performance of more detailed physical examinations.

Confirmed tuberculin reactivity in 9.5% of the inmates represents a potential reservoir of active tuberculous infection. Accordingly, we perform PPDs on individuals not known to be reactive and chest Xrays on all reactors. We discuss the genetic and clinical significance of sickle cell trait with Blacks and offer testing for the trait to them. We do not perform routine urinalysis or laboratory screening for anemia and syphilis in the absence of pertinent historical information.

Acknowledgments

Darwin Hendel, Ph.D., University Measurement Services Center, University of Minnesota, and Donald R. Houge, Ph.D., Department of Family Practice and Community Health, University of Minnesota Medical School, Minneapolis, assisted in the performance of statistical calculations. The author acknowledges the assistance of Charlotte Weiss, R.N. in all phases of this study.

*Information supplied by the Minnesota Department of Health.
†Information supplied by the Ramsey County Lung Association.

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table benzathine penicillin is considered to be the drug of choice in the treat- and prevention of streptococcal infections, including the prophylaxis of rheu- fever.

ef' is effective in the eradication of streptococci from the nasopharynx; ever, data establishing the efficacy of 'Ancef' in the subsequent prevention eumatic fever are not available at present.

itourinary tract infections due to *Escherichia coli, Proteus mirabilis, Kleb-* species, and some strains of enterobacter and enterococci.

and soft-tissue infections due to *S. aureus* (penicillin-sensitive and illin-resistant) and group A beta-hemolytic streptococci and other strains reptococci.

e and joint infections due to *S. aureus.*

icemia due to *Str. pneumoniae, S. aureus* (penicillin-sensitive and penicillin-tant), *P. mirabilis, E. coli,* and *Klebsiella* species.

ocarditis due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and p A beta-hemolytic streptococci.

opriate culture and susceptibility studies should be performed to determine eptibility of the causative organism to 'Ancef'.

traindications: 'Ancef' is contraindicated in patients with known allergy to ephalosporin group of antibiotics.

nings: BEFORE CEFAZOLIN THERAPY IS INSTITUTED, CAREFUL INQUIRY ULD BE MADE CONCERNING PREVIOUS HYPERSENSITIVITY REACTIONS CEPHALOSPORINS AND PENICILLIN. CEPHALOSPORIN C DERIVATIVES SHOULD BE GIVEN CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS.

SERIOUS ACUTE HYPERSENSITIVITY REACTIONS MAY REQUIRE EPINEPHRINE AND OTHER EMERGENCY MEASURES.

There is some clinical and laboratory evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both drugs.

Antibiotics, including 'Ancef', should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Usage in Pregnancy—Safety of this product for use during pregnancy has not been established.

Usage in Infants—Safety for use in prematures and infants under one month of age has not been established.

Precautions: Prolonged use of 'Ancef' may result in the overgrowth of non-susceptible organisms. Careful clinical observation of the patient is essential.

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Administration and Dosage: 'Ancef' may be administered intramuscularly or intravenously after reconstitution. See the package literature for reconstitution procedures.

See the package literature for dosage recommendations.

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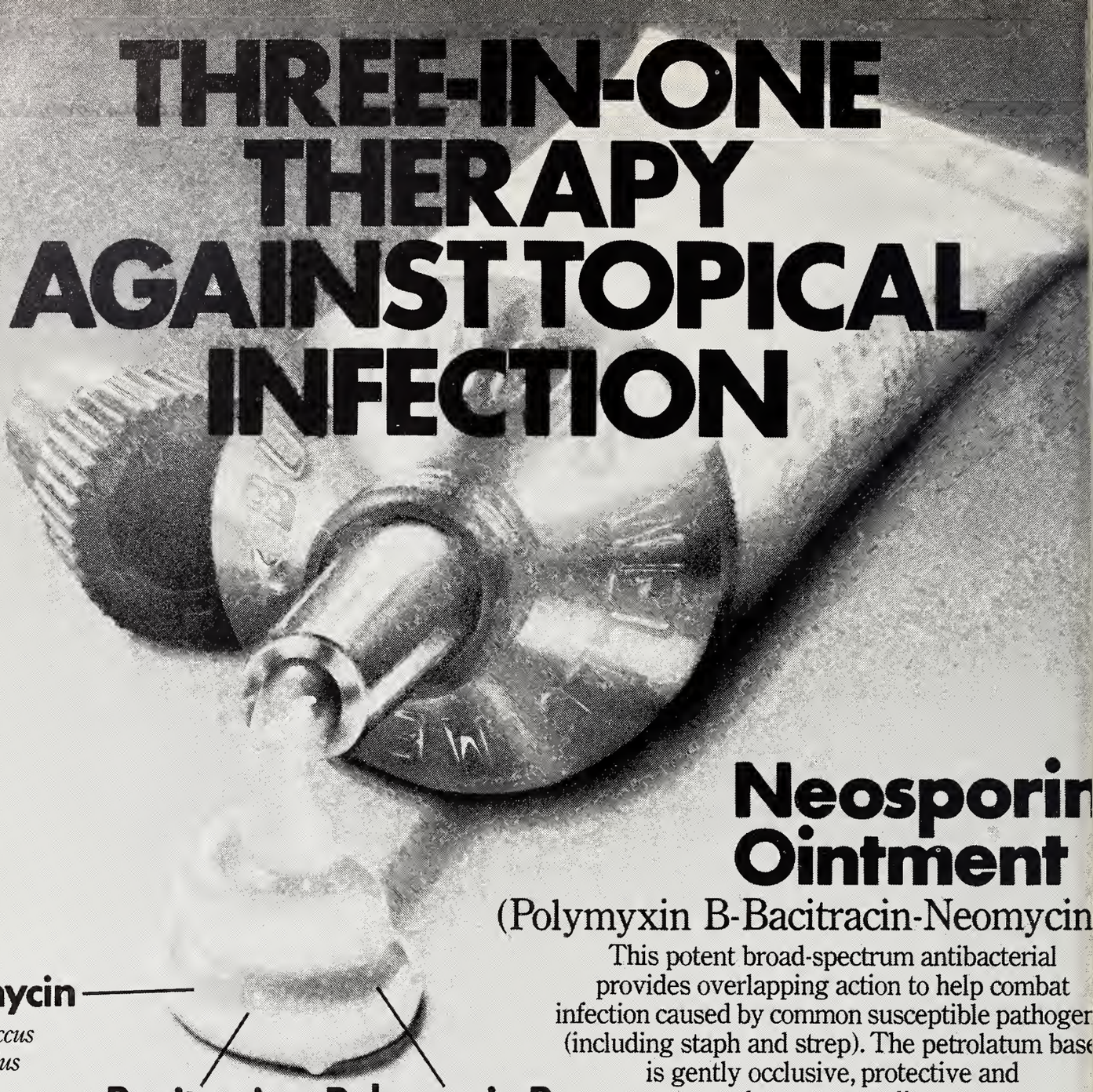
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Complete literature available on request from Professional Services Dept. PML.

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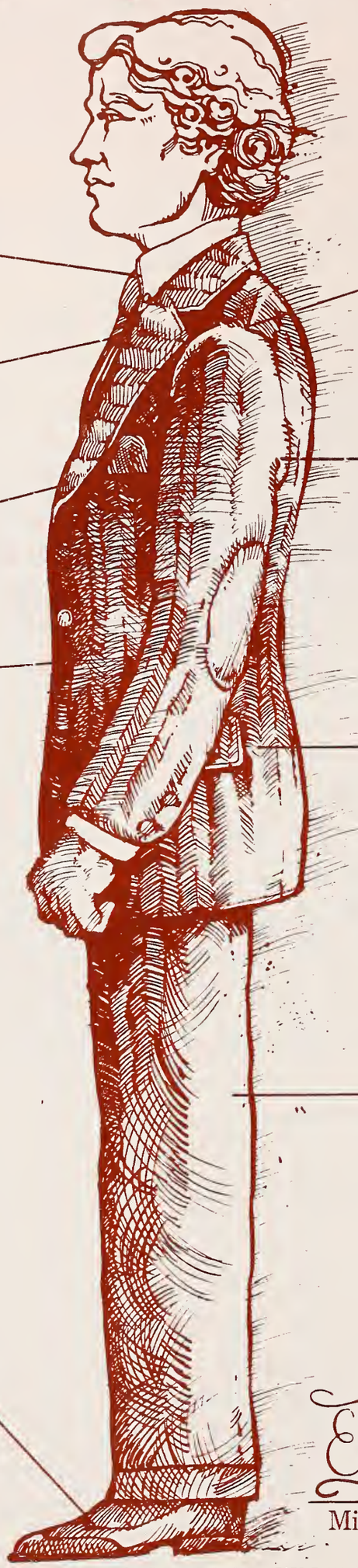
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President's Letter

The Minnesota Medical Association

The Minnesota Medical Association has had a long and illustrious career in the pursuit of its stated objectives to advance the science of medicine and promote the public's health. Many have been in positions of leadership over the years, but few have been as experienced or effective in the area of guidance of public policy as our most recent president, Chester A. Anderson, M.D. Thank you, Chester, for a job well done during the past year as well as in the previous six years guiding the Legislative Committee's efforts.

Many physicians have been slow to recognize, much less accept, the reality that it is no longer sufficient to merely deliver medical care which is adjudged excellent by knowledgeable peers.

Medical care must constantly be demonstrated to be excellent to a more knowledgeable, but more skeptical, public which is prone through its elected, appointed, or employed officials to assume it can quickly set someone else's house in order, no matter what its own track record may be, either in accomplishment, financial efficiency, or deceleration of cost acceleration rates of other public activities.

MMA has an ongoing opportunity to minister to the health needs of its Minnesota patients by applying methods familiar to each physician. It must first take the history and ferret out the complaints. (The chief complaint at the moment is cost.) Next comes the examination which in addition to the time honored methods of physical exams as to the general status must now include objective measurements of the state of the public health and its component parts in exhaustive detail but ever with direction toward collecting the most meaningful data. Finally, the therapy must be effective, relatively free of unwanted side effects, and acceptable to the recipient, to insure compliance. Simplistic as this may sound, it can result in improved rapport between advisor and advisee.

MMA has in recent years been enhancing its skills in listening, examining, and measuring data, and in communicating recommended therapy to the public through its new divisions and departments, and in consultation with a variety of community leaders. Abundant, also, is the talent present in its individual members who acting in concert after careful deliberation, can exert considerable influence (some would even call it power) upon the health and well being of its patient, the public. Each member, however, must participate in his/her own way so that the efforts of MMA may be representative and effective.

Robert S. Flom

Robert S. Flom, M.D.
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Editor's Notebook

MINNESOTA MEDICINE
Editor's Report to House of Delegates

I have always subscribed to the philosophy that if you have a nail to hit, hit it on the head.

Therefore, I shall open this report by observing this is the most inflationary year MINNESOTA MEDICINE has experienced since I became Editor in January 1975. For 1977, MINNESOTA MEDICINE was $8,010 over budget — the first we have exceeded the budget during my editorship. A glance at the Journal's budget track record will put this year's performance in perspective.

Year	Budget	% Increase	Financial Picture
1973	$40,000	0	$219 under budget
1974	40,000	0	$8,720 over budget
1975	40,000	0	1,163 under budget
1976	44,000	10	932 under budget
1977	46,000	4.5	8,010 over budget
1978	49,000	6.5	700 under budget (first three months)

Why were we over budget? Mostly, I suspect, because we tried to ignore inflationary pressures the past four years. This year inflation caught up with us.

Examine the Table below, and note that the cost of printing the Journal accounts for most of this year's budget overrun. The cost of printing is something we cannot control. The Editor can control the total number of pages printed — 896 in 1977 versus 890 in 1976 — and local advertising — up 39% in 1977 over 1976.

Income	1976	1977
National Advertising	$27,348.00	$26,197.00
Local Advertising	9,175.00	12,798.00
Reprints	8,541.00	8,724.00
Classified ads	5,812.00	5,783.00
Printing Journal	50,600.00	59,267.00
Mailing Journal	3,920.00	4,345.00

I am optimistic our cost picture will be better in 1978 than in 1977. My optimism rests on these factors: (1) we made the transition to offset printing (a more expensive procedure) last August and now know how to minimize its expense; (2) so far this year we are running $700 under budget; (3) we now have two media sales representatives who are paid on a commission basis to obtain local ads; (4) our national advertising is up considerably for the first four months of 1978 — $9,077 this year versus $6,593 for 1977, a 38% increase; and (5) we plan to keep the number of pages below 900 for the year.

So much for our money problems. Now a few remarks on the Journal itself.

You may recall that in the March, 1978, issue of MINNESOTA MEDICINE, we published a questionnaire asking readers what sections of the Journal they liked and if they thought we had the proper balance between scientific and non-scientific. Our distribution of material in 1977 was:

	Total Pages for 1977	Percent of Total Pages
President's Letter	25	5%
Editor's Notebook	40	8%
Clinical and Scientific Pages	343	67%
Interviews	56	10%
Political, Economic, and Social	55	10%

We received 84 questionnaire replies with this percentage distribution:

(1) Which sections of MINNESOTA MEDICINE do you read:

Scientific	88%	History of Medicine	53%
Editorials	78%	Laboratory Medicine	52%
President's Letter	72%	Continuing Medical Education	47%
Special Articles	67%	Interviews	46%
Editor's Notebook	64%	Grand Rounds	44%
Socio-economic articles	63%	Book Reviews	40%
Health Care Cost Commission	57%	Fracture Conferences	37%
Special Issues	57%	Gerontology	30%

(2) Which sections do you read the least?

Book Reviews	18%	Health Care Cost Comm.	2%
History of Medicine	15%	Special Issues	2%
Fracture Conferences	11%	Classified ads	2%
Editorials	7%	Continuing Medical Education	2%
Interviews	7%	Ads	1%
Gerontology	5%	Laboratory Medicine	1%
Grand Rounds	5%	Special Articles	1%
President's Letter	2%	Editor's Notebook	1%
		Scientific Articles	1%

(3) Do you think MINNESOTA MEDICINE has the proper balance between scientific and non-scientific material?

(a) Yes: 88%
No: 12%

	About Right	Too Many	Too Few
(b) Scientific articles	76%	4%	20%
Interviews	80%	20%	0%
Health Care Costs	84%	9%	7%
Annual Meeting	86%	11%	3%
Socioeconomic	75%	9%	16%

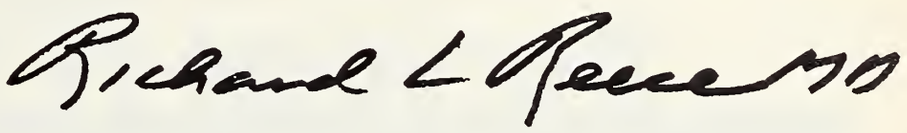
What, if anything, do I conclude from these results:

(1) The most popular feature of MINNESOTA MEDICINE continues to be scientific articles. Indeed, 20% of the readers felt we had too few scientific articles. This year we shall publish more scientific articles.

(2) Most readers (88%) seem to think we are striking the right balance between scientific and non-scientific material. Twenty percent say we have "too many" interviews, but 16% say we have "too few" socioeconomic articles. Our present plans are to reduce the number of pages devoted to interviews (10% last year) and to increase slightly the socioeconomic material, but not at the expense of scientific articles.

Because 84 questionnaire replies represent a small sample, sweeping conclusions are not justified. One feature of our questionnaire I did not mention was our request for specific suggestions to improve MINNESOTA MEDICINE. Most suggestions were favorable and indicated a desire for more scientific material. One questionnaire suggested we scrap MINNESOTA MEDICINE all together and the Minnesota Medical Association along with it. Because the Board of Editors and the Officers of the Association are not ready for the scrap heap, we have decided to ignore the suggestion.

My aim remains to produce a Journal that educates, informs, stimulates and even amuses. More than anything, I seek a balance between the basics of a good scientific journal and one which discusses openly the social issues of medicine. I remain persuaded that it is possible to be scientifically factual and socially frank within the confines of the same publication.



University of Minnesota Medical Alumni Association

The Medical Alumni Association of the University of Minnesota will sponsor the Annual Medical Class Reunion on June 17, 1978. Plans include a one-day, continuing medical education seminar on campus. Diehl awards will be presented to Herman E. Drill, M.D. and Lester H. Bendix, M.D.

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Pulse Delay in Subclavian Steal

SIDNEY K. SHAPIRO, M.D.*, MURTHY TADAVARTHY, M.D.*
TERRY GUNTHER, B.S. M.A., REUBEN BERMAN M.D.*

A patient with Subclavian Steal Syndrome (SSS) is presented in which delay in the radial pulse is graphically documented. Absent or diminished radial pulse, reduced systolic and diastolic blood pressure are well known in SSS. Pulse delay, however, is a neglected sign, easily appreciated clinically and should be a part of a cardiovascular or neurological examination. The asymptomatic patient requires no specific therapy. Various surgical procedures are discussed.

Occlusion of the subclavian artery proximal to the vertebral may result in rerouting the circulation to the upper extremity through the vessels of the brain via the vertebral artery.[1] Anatomists have long known of the cerebral collateral routes to the subclavian artery.[2] Willis in 1664 anticipated the subclavian steal writing, "in the carotid system the blood may enter on one side and on the other haste backwards by the same way and run back with the ebbing tide."[3]

In 1960, Contorni[4] reported that a stenotic lesion in the subclavian artery proximal to the origin of the vertebral artery could result in reversed vertebral artery flow. In 1961, vertebrobasilar insufficiency resulting from this reversal of flow was documented for the first time[1] and the syndome labeled "subclavian steal" (SSS).[3] Numerous publications followed, [5,6,7,8,9] with colorful names such as "vertebral grand larceny,"[10] "bilateral steals,"[11,12] "double steal,"[13] and "triple steal,"[14] "intercranial steal,"[15] "the Robinhood syndrome,"[16] "occipital vertebral steal,"[17] "the ophthalmic steal,"[13,17] and "asymptomatic steal."[13]

Blood pressure is normally higher at the origin of the carotid and vertebral arteries than it is in their most distal branches and consequently blood flows towards the brain. However, when the pressure in the proximal artery is reduced by 10%, blood flow in the distal branch decreases and when the reduction exceeds 20%, flow reverses direction. In the case of vertebral artery flow, this reduction in pressure and reversal of flow is increased due to dilatation of the muscular bed when the arm is exercised. This feature, a pulse delay, a subclavian-vertebral bruit and a difference in blood pressure of at least 20 mm. of mercury between the two arms are the four components of the SSS.[18] Pulse delay although adequately documented in the literature is not commonly sought for clinically. A review of 168 cases by the joint study of extracranial arterial occlusion failed to mention this important clinical sign being tested for a single case.[26]

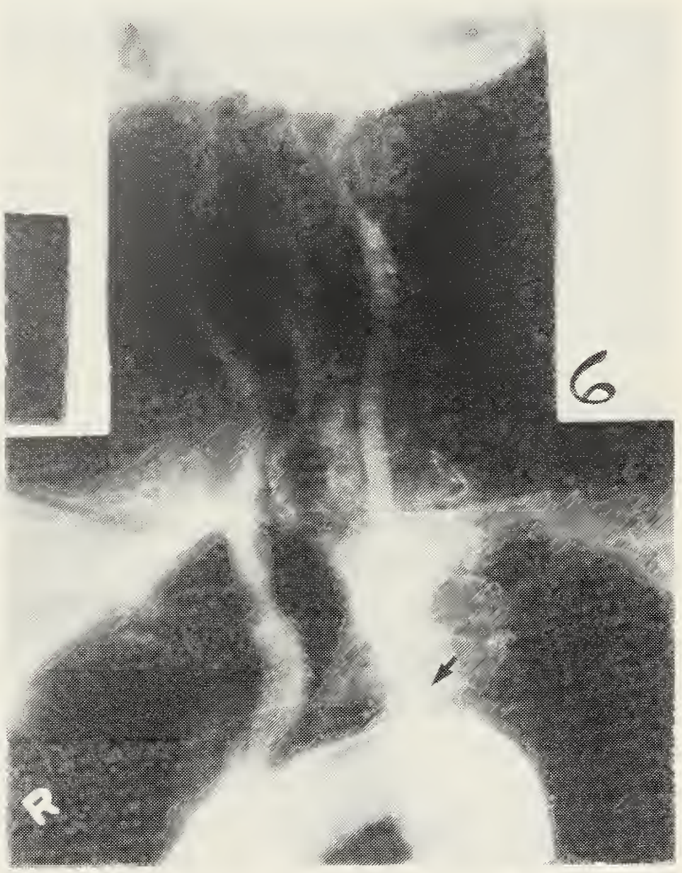


Fig. 1 — Early phase of aortogram showing filling of both carotids, right vertebral and subclavian arteries. Arrow points to complete closure of left subclavian one cm. from its origin. Left vertebral is not opacified.

*Mount Sinai Hospital, Minneapolis, Minnesota.

Presented at the May, 1978 Meeting of the Minnesota Society of Internal Medicine, in Duluth, Minnesota.

Case Report

A 67-year-old, retired salesman complained of three weeks of intermittent dizziness prior to hospital admission. Dizziness was worse in the supine position and accentuated by head motion. Pertinent physical findings were reduction of blood pressure in the left arm, 92/66, compared with 110/72 on the right, normal carotid pulsation with no bruit. The left wrist pulse was weak and palpably delayed. Neurological examination was non-contributory. Chest Xray and electrocardiogram were normal.

Aortography in the early sequence shows the brachiocephalic and left carotid arteries. The left subclavian is completely occluded one cm. distal to its origin (Figure 1).

In the late phase, retrograde flow of contrast via the vertebrobasilar system opacifies the distal left subclavian artery (Figure 2). The radial pulses are graphically displayed in Figure 3 showing late arrival of onset and peak pulse on the left side, timed from the R wave of the electrocardiogram. A delay of onset of pulse of 0.03 sec. and peak pulse delay of 0.13 sec was found on the left. The patient was treated with oral anticoagulation with subsidence of symptoms.

Discussion

Diminution in the force of the radial pulse and reduction of blood pressure in the involved side in SSS are well known. Conrad et. al.[24] in four cases showed delay in the onset of digital pulse of 0.03 to 0.12 seconds and peak delay of 0.07 to 0.20 seconds. Grossman[23] using the Doppler technique measured the pulse delay against the R wave to the peak of the pulse wave upswing in the upper third of the arm. He found delays of 0.03 to 0.06 seconds. In 12 normal controls, there was no time change in those pulses greater than 0.01 seconds.

Delay of this magnitude suggests that the pulse is transmitted through the collateral circulation. In our case, with complete occlusion of the subclavian, the pulse transmission must have proceeded through the vertebral and basilar circulation, the largest collaterals about the obstruction.

A delay may be appreciated manually palpating both radial pulses simultaneously.

The average age of patients with SSS is 50-60 years[19,20] and there is a predominance in men (70%). It also occurs 3 times more often on the left side.[21] Symptoms generally occur in older patients, seldom in children. The arm symptoms are due to ischemia and usually with a frequency of about 40% consist of paresthesias, feelings of coldness and weakness. Rapid weariness during arm exercises, pain while resting and skin pallor occur at about 20% frequency, but pain during exercise seldom occurs (8%). Fingertip gangrene is rare, but has been described, as have forearm and hand atrophy and petechial bleeding of the fingers.[19] The neurological manifestations of the subclavian steal are usually those of vertebrobasilar artery insufficiency: dizziness (75%), visual defects (36%), syncope (25%), ataxia (11%), and heterogeneous motor and sensory symptoms (11%). However, they may include headaches (44%), alterations in speech (11%), memory changes (8%), personality disorders and insomnia. Cerebral and arm symptoms together (42%), are more frequent than arm symptoms alone (11%).[19,20]



Fig. 2 — Late phase of aortogram (about 6-7 seconds after Figure 1) Left vertebral is opacified collaterally supplying distal left subclavian: the subclavian steal.

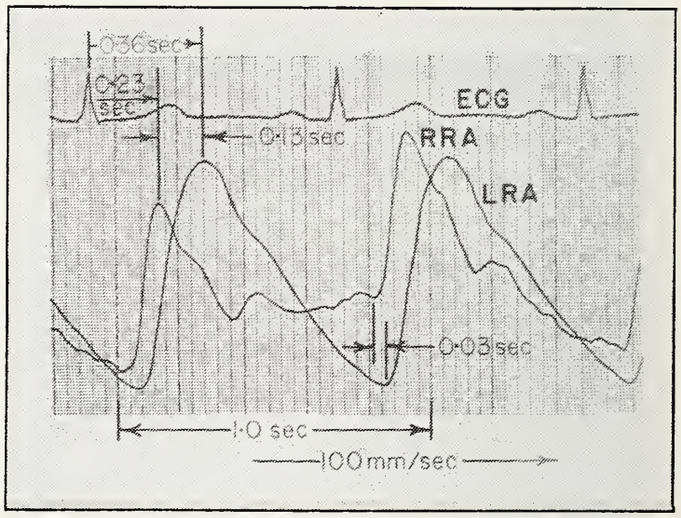


Fig. 3 — Pulse recording of right radial artery (RRA) and left (LRA) timed from the ECG R wave. Delay in LRA onset is 0.03 seconds and 0.13 seconds at peak of pulse.*

*Pulses recorded with Hewlett Packard #21050A ceramic (Piezo electric) crystal.

The radial pulse in the affected side is either delayed, diminished or absent in 98% of patients.[22] In eight patients with quantitated abnormal pulse delays ranging from 0.014 to 0.2 seconds all had complete occlusions while the pulse delay in normal controls was less than 0.01 seconds.[23,24] A delayed pulse arrival time is almost pathognomonic of the SSS.[18] The simple maneuver taking both radial pulses simultaneously should be a routine part of a vascular and neurological examination.

Treatment

A series of surgical operations have been directed towards SSS, including thromboendarterectomy with, if necessary, patch grafting or replacement, and bypassing the obstruction by grafting the subclavian artery to the aorta or the carotid artery. A carotidsubclavian anastomosis is advantageous because it can be performed through the supraclavicular approach without the need for a thoracotomy.[18] Ligation of the vertebral artery, the subclavian artery or both has been used to reduce the drain on the cerebral circulation and to shunt the blood into the brain. Such ligations can be done through a cervical approach in poor-risk patients under local anesthesia. An intrathoracic surgical bypass procedure that allows histologic examination of the subclavian artery is recommended when the cause of the syndrome is in doubt.[21] Operations upon the carotid and brachiocephalic arteries are available when the circle of Willis is intact.

A joint study of extracranial arterial occlusion concluded that there was no significant difference in survival when the medical and surgical groups were compared.[26]

Medical treatment includes anticoagulant therapy and avoidance of activities of the arm which produce symptoms. Surgery is inadvisable in the asymptomatic patient.

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Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

Low-Dose Insulin Infusion Therapy of Diabetic Ketoacidosis in Children

KRISHNA M. SAXENA, M.D.;* STANLEY A. LEONARD, M.D.;† and JAMES LYNN CASEY, M.D.‡

Thirteen episodes of diabetic ketoacidosis in eleven children were treated with I.V. infusion of insulin (0.1 unit/kg/hr). The dose was decreased to 0.05 U/kg/hr when serum acetone became negative and/or blood glucose dropped to 200 mg/dl. The patients responded promptly and uniformly. Serum acetone became negative in average of eleven hours. There were no complications. The method was easy and safe. We recommend low-dose I.V. insulin as the treatment of choice for children with diabetic ketoacidosis.

THE TREATMENT of diabetic ketoacidosis is a perplexing problem for the practicing physician. The literature is replete with various dosage schedules for insulin administration, each group of investigators having their own protocol. Currently, most of the recommended protocols use combinations of intravenous boluses of insulin with subcutaneous and/or intramuscular insulin. Although widely practiced, this traditional form of treatment has several disadvantages, such as: hypoglycemia, hypokalemia, and cerebral edema. Recently, several articles have appeared regarding the treatment of diabetic ketoacidosis with a continuous intravenous infusion of low dose insulin.[1–3] For the past two years, we have satisfactorily treated a number of children with diabetic ketoacidosis by this method. The following report reflects our experience confirming the ease, safety, and effectiveness of low dose I.V. insulin therapy.

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‡Children's Clinic, Greeley, Colorado, and formerly Fellow in Pediatric Endocrinology, University of Minnesota.

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See editorial, page 359.

Materials and Methods

Thirteen episodes of diabetic ketoacidosis in 11 children were treated at the Children's Hospital, St. Paul from December, 1974 to October, 1976. The age range was two to 18 years, nine of the patients being ten to eighteen years of age. Ten cases were known insulin-dependent diabetics. One two-year-old child was a new diabetic. In every case, the family and admitting physicians were advised of the nature of the treatment proposed, and consent was obtained for the I.V. insulin therapy. The patients were treated in a special unit with close follow-up by nurses and house staff. The Table gives the initial clinical and biochemical data. All patients had moderate to severe

TABLE

Initial Biochemical Data before Starting Rx

Case #	Age	Sex	Bl. Glucose mg%	pH	CO_2 mEq/L	Osm	Na	K	Serum Acetone
1	2	M	1010	7.03		367	136	5.6	Mod.
2	9	M	429	7.26	15	317	135	5.0	Small
3	6	F	484	6.89			128	4.3	Small
4	16	F	658	7.08	7	339	138	5.7	Mod.
5	18	F	660	7.16		329	137	5.4	Mod.
6	15	M	502	7.08			140	4.5	Mod.
7	11	M	343	7.31	17	314	140	4.7	Small
8	11	M	976	6.90		367	139	6.0	Large
9	9	F	391	7.14		333	141	5.0	Small
10	11	F	443	7.22		315	135	5.5	Mod.
11	12	M	287	7.27	9	319	139	4.3	Small
12	16	F	645	7.12	5	362	142	5.4	Large
13	17	F	444	7.03	5	320	140	4.4	Mod.

ketosis and nine of the thirteen had a pH of less than 7.2. Serum and urine acetone and glucose were measured hourly for the first eight hours and then every two hours for 24 hours. Serum sodium and potassium were determined every two hours until the serum acetone became negative. Other investigations were done and repeated as necessary.

The overall management, including hydration, electrolyte therapy, and other supportive care, was similar to the standard management of other diabetic children in our hospital. The only planned variable was the dose and method of administration of insulin. The initial fluid was either normal saline or Ringer's lactate without Dextrose until urine output was achieved. A multiple electrolyte solution in 5% Dextrose (Isolyte M), was used as the maintenance fluid therapy. The glucose concentration was increased to 10% when the blood sugar fell below 200 mg%.

Insulin

Intravenous insulin (U100) was administered in the following manner: 20 cc. of normal saline was mixed with 20 units of insulin. This was placed in the "Soluset" of an infusion set and administered at the desired rate through a Hollister pump. The polyethylene tubing containing the insulin was attached to the tubing of the regular intravenous fluids at the medication side-arm closest to the patient. Albumin was not mixed with the insulin. A fresh mixture of insulin was prepared every four hours and the polyethylene tubing was changed every four hours. Insulin was administered at the rate of 0.1 unit per kg. body weight per hour by continuous drip. A loading dose of insulin was not given. The dose was reduced to 0.05 units per kg. per hour when the serum acetone became negative and/or serum glucose became 200 mg% or less. The total duration of I.V. insulin therapy varied from eight to twenty-four hours, depending upon the patient's response.

Results

The blood glucose levels are depicted in Figure 1. The rate of fall was maximum in the first four hours. There were no episodes of hypoglycemia or hypokalemia. The mean time for serum acetone to become negative was 11 hours (range three to 17 hours) and for urine acetone 23 hours (range nine to 42 hours). The decrease in serum acetone and glucose was roughly parallel, as seen in Figure 2. This was accompanied by simultaneous clinical improvement in the patient's condition. One patient had an appendectomy about an hour after starting I.V. insulin treatment. Her course was smoooth and recovery uneventful.

Discussion

Interest in continuous I.V. insulin treatment was stimulated by the appearance of three articles in the *British Medical Journal* in 1974.[1–3] Their patients were

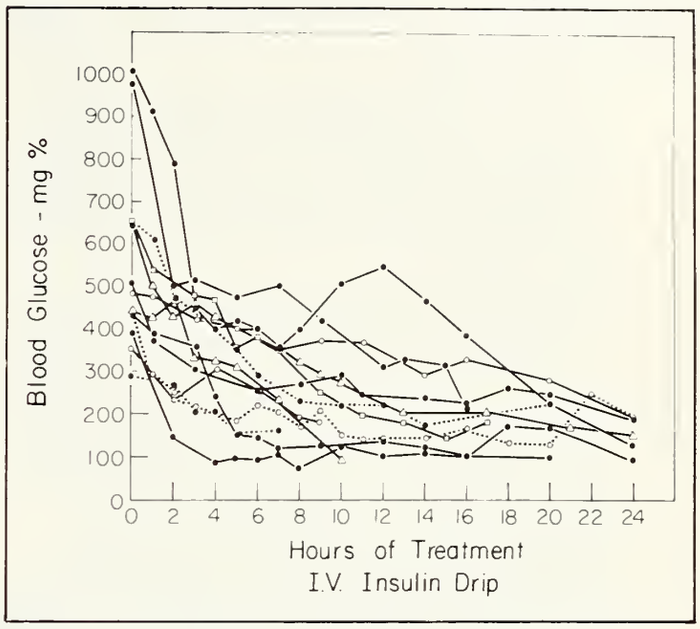


Fig. 1 — Blood glucose levels during I.V. insulin infusion.

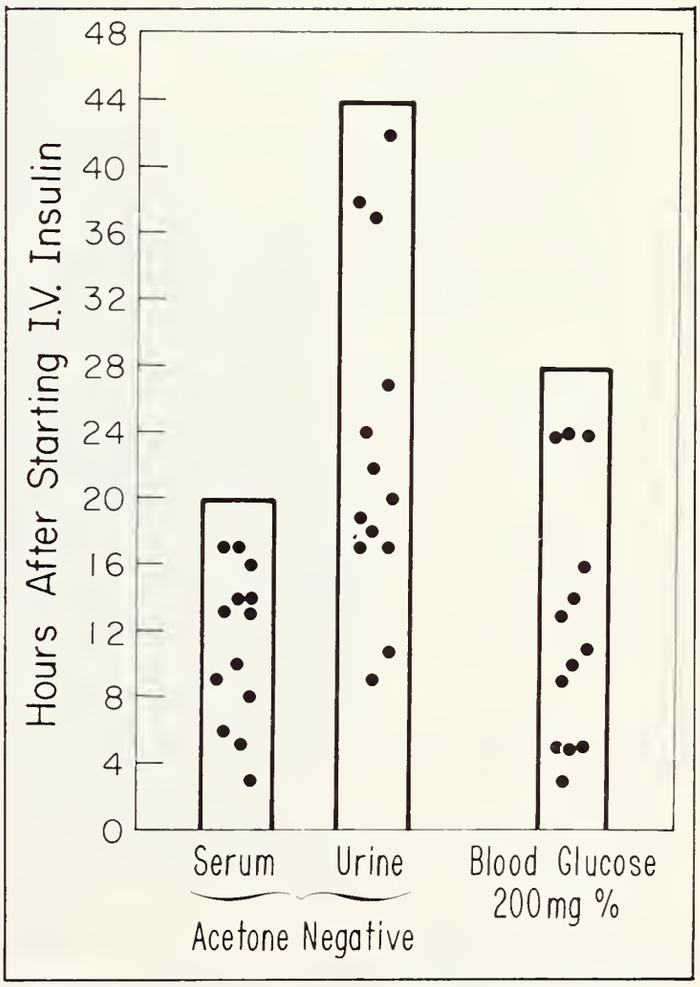


Fig. 2 — Time taken for serum and urine acetone to become negative and blood glucose to fall to 200 mg%.

mostly adults. Since then, other workers have reported results of similar intravenous insulin therapy in children.[4-6] Our results confirm that low doses of insulin given continuously by I.V. drip can promptly, safely, and adequately control diabetic ketoacidosis in children.

The main advantages of the continuous I.V. insulin therapy are as follows:

1. It is a relatively simple method of treatment and dispenses with much of the confusion and variability that was present when larger doses were given at irregular intervals. This method avoids the vagaries of absorption of subcutaneous or I.M. doses. It also avoids the large variation in serum insulin levels produced by intermittent large I.V. doses.
2. The response to therapy is rapid and uniform — (but comparable to that seen in a variety of others protocols). The rate of fall in serum glucose and acetone observed by us were uniform and consistent with rates seen by other workers.
3. The incidence of hypokalemic and hypoglycemic reactions is much less than when larger doses of insulin used to be administered. We did not observe a single case of these complications in our patients.
4. Adequate serum levels of insulin are maintained with I.V. infusions given at the rate of 0.1 to 0.05 U/kg/hour.[1] Insulin infusion at the rate of 0.05 U/kg/hr after a priming dose of 0.02 U/kg/hr resulted in a steady state serum insulin concentration of about 130 uU/ml.[7] Since serum insulin levels of 200 uU/ml produce maximal glucose transport,[8] there is no advantage in giving larger doses of insulin intravenously.
5. When a steady state has occurred after the initial fall, there is a linear decline of blood glucose of 75-100 mg/dl/hour.[1-3] This makes the management of the patient more predictable and easy. A relatively slow, steady fall of sugar should also decrease the possibility of developing cerebral edema with its consequent high mortality.
6. The average period of hospitalization of our patients was shorter with continuous I.V. treatment (three days) than with the older method (five days).

Some authorities have questioned the rationale of low dose I.V. insulin therapy and have advocated caution.[9-11] Several disadvantages have been postulated. One is that hypokalemia may be more likely to occur since urine losses of potassium are greater.[11] However, the retention of administered potassium in their patients depended on whether bicarbonate was given or not rather than the route and dose of insulin.[11] It has been pointed out that prolonged acidosis despite correction of blood glucose may be a problem with continuous insulin infusion.[11] Other workers have not reported this problem to our knowledge. In our patients, the average time for the correction of acidosis was approximately 12 hours.

It has been postulated that levels of insulin in the hepatic circulation may be very low with low-dose infusion even though the blood levels may be adequate.[9] The prompt correction of ketosis, acidosis, and hyperglycemia with low-dose I.V. insulin therapy suggests that this observation is not of practical significance.

The use of albumin or polygeline in the insulin solution has been advocated because of absorption of insulin by the tubing and bottle wall.[12-13] By using a fresh solution of insulin every four hours and a polyethylene tubing,[14] we have encountered no problems in the management of diabetic ketoacidosis although the insulin solution did not contain any carrier proteins.

Diabetic ketoacidosis is a serious condition deserving close surveillance by medical and nursing staff irrespective of the type of insulin regimen followed. Our experience with continuous I.V. insulin therapy parallels that of other authors. We find this method safe, simple, efficient and uniform. It is easy to follow by nurses and house staff. I.V. insulin therapy was preferred subjectively by the patients over the previous standard method primarily because it avoided multiple intramuscular and subcutaneous injections.

Our experience with low-dose I.V. insulin therapy and the reports of other authors[4-6] do not substantiate the disadvantages postulated by the earlier editorial comments. We have been impressed with the ease and safety of the continuous I.V. therapy and recommend it as the treatment of choice for children with diabetic ketoacidosis.

Acknowledgment

We wish to thank the house staff and nurses who took care of these patients. We would also like to thank the physicians who allowed their patients to be included in this study.

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Time is the test of all things.



BRIEF SUMMARY

Indications: Oral potassium therapy for the prevention and treatment of hypokalemia which may occur secondary to diuretic or corticosteroid administration. May be used in the treatment of cardiac arrhythmias due to digitalis intoxication.

Contraindications: Severe renal impairment with oliguria or azotemia, untreated Addison's disease, adynamia episodica hereditaria, acute dehydration, heat cramps and hyperkalemia from any cause.

Precautions: Potassium intoxication by oral administration rarely occurs in patients with normal kidney function, however, potassium supplements must be administered with caution, since the amount of the deficiency or daily dosage is not accurately known. Frequent checks of the clinical status of the patient, and periodic ECG and/or serum potassium levels should be made. High serum concentrations of potassium ion may cause death through cardiac depression, arrhythmias or arrest. This drug should be used with caution in the presence of cardiac disease.

In hypokalemic states, especially in patients on a low-salt diet, hypochloremic alkalosis is a possibility that may require chloride as well as potassium supplementation.

Adverse Reactions: Nausea, vomiting, diarrhea, and abdominal discomfort have been reported. The most severe adverse effect is hyperkalemia.

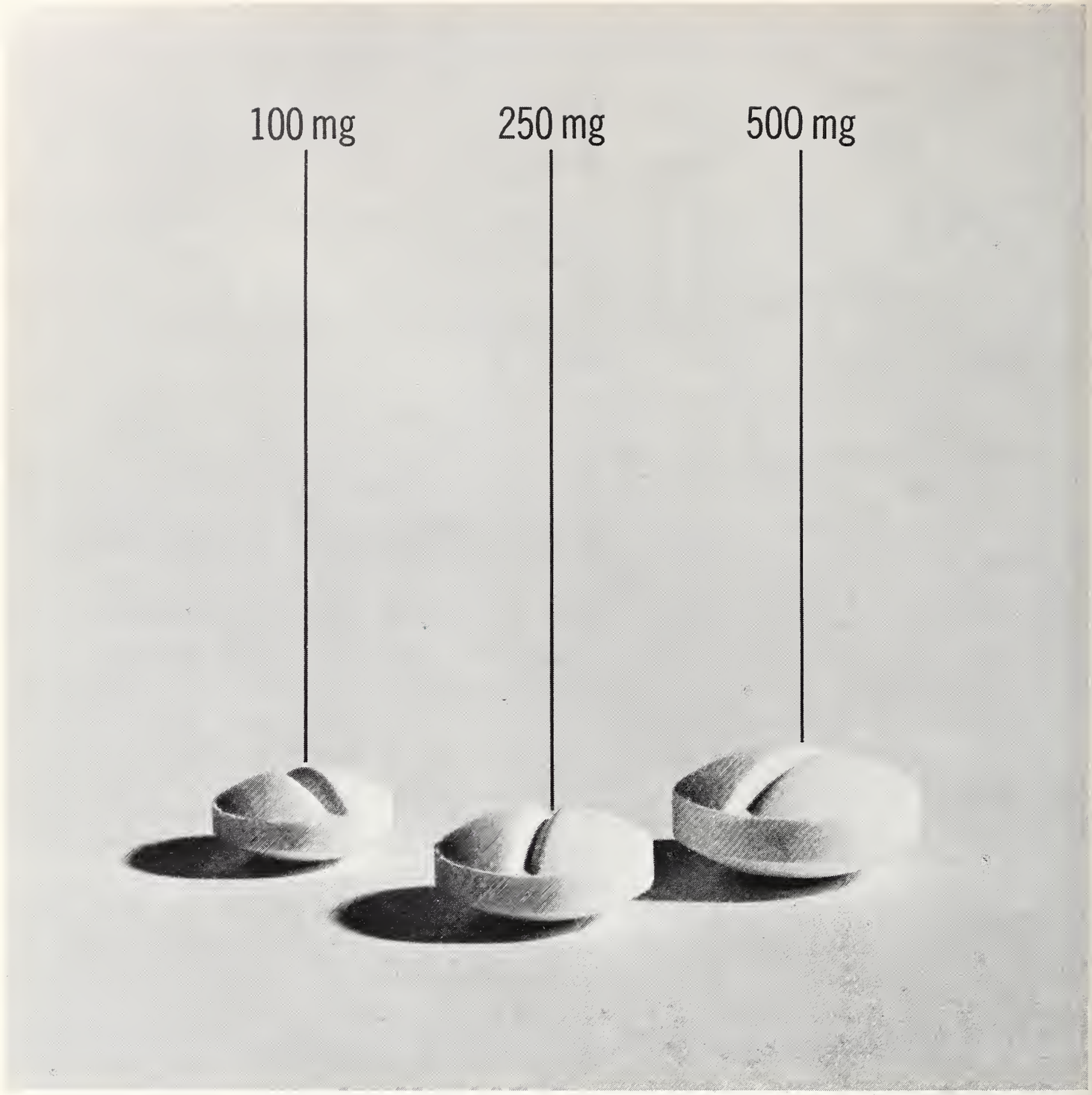
Overdosage: Potassium intoxication may result from overdosage of potassium or from therapeutic dosage in conditions stated under "Contraindications". Hyperkalemia, when detected, must be treated immediately because lethal levels can be reached in a few hours.

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Editorials

Diabetes Duplicatus — Confusion or Infusion?

THE PERENNIAL CONTROVERSIES of diabetes mellitus continually present the clinician with a never ceasing potpourri of mutually exclusive alternatives. Philosophically polar positions regarding the best approach to the patient are a continual dilemma. A constant battle rages between rigid control in the interest of avoiding long term vascular changes and other possible chronic complications and a more liberal approach considering the psychological aspects of daily life and the avoidance of hypoglycemia.

Now a dualism has entered into the management of acute ketoacidosis. Traditional intervention for regulating this state of insulinapenic metabolic aberration has advocated the use of generous quantities of regular crystalline insulin administered by both IV and subcutaneous or intramuscular routes. Dosages of 0.5 to 2.0 units per kilogram every one to two hours were recommended depending on the level of serum ketones and the patient's blood glucose. Compulsive monitoring of major chemical parameters such as serum ketones, potassium, pH, HCO_3-, glucose and sodium are essential as well as careful management of intravenous fluids. Implicit in such a regimen is the risk of hyperinsulinization with the consequences of hypoglycemia and hypokalemia. Such a program has been the mainstay in our therapeutic armamentarium for acute diabetic ketoacidosis and an effective educational system as it has required continual assessment and appreciation of the physiological abnormalities of the affected patient.

Saxena, et. al.,* present a very lucid and cogent demonstration of the effectiveness of low-dose insulin infusion in the pediatric diabetic patient. Their study provides a sufficiently representative population with regard to age, sex, severity of presentation and degree of hyperglycemia and ketosis. This therapeutic approach has been enjoying progressive acceptance during the past three years. Utilizing dosages of 0.1 units per kg. per hour of regular insulin by continuous infusion a more prompt and uniform clinical response is described by all investigators advocating this program. By definition, hyperinsulinization is avoided and thereby the risks of hypoglycemia and hypokalemia are significantly reduced. In the present study, these iatrogenic hazards were completely avoided. Whether such an approach is truly "more physiologic" can be argued teleologically, since in reality beta cells are not functionally intact to behave physiologically in the true ketoacidotic state vis-a-vis, by which it therefore comes about. However, our own experience with the method of low-dose insulin infusion therapy has convinced us that this is an extremely effective and desirable modality in the proper clinical setting and with attention to the other aspects of overall management as in the traditional methods of insulin therapy.

Caution, however, is indicated before we generalize that low-dose insulin infusion is now the method of choice for all patients, settings and circumstances. Utilization of this regimen requires the availability of an intensive care facility with experienced nursing personnel and proper infusion equipment. Unlike the more traditional methods, where full-time physician attention was required at the bedside, this approach has revealed a tendency to relegate the management of the patient to supporting non-physician professionals once the infusion is begun. Experiences with house staff in a training situation have disclosed in many cases, a less

*See page 354.

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(MONDAY, SEPTEMBER 11, 1978)

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(MEETING)

ALLOCUTION SUR LE THÈME PRINCIPAL
(SPECIAL KEYNOTE SPEAKER)

SENATOR NANCY BRATAAS

WEEKEND IN FRANCE PACKAGE
INFORMATION TO FOLLOW!

sophisticated and detailed appreciation of the pathophysiology of acute ketoacidosis than was required in utilizing the standard higher dose bolus insulin methods. A word of caution is directed toward our rapture with technology as leading to a more laissez-faire attitude in our perception of this most significant dysequilibrium state.

What Saxena et. al. have definitely demonstrated is that careful monitoring, appreciation of the aspects of overall management, knowledgeable medical personnel and avoidance of hyperinsulinization are essential prerequisites to optimal management of the patient with acute diabetic ketoacidosis, regardless of the program chosen.

David Raoul Brown, M.D.*
Minneapolis, Minnesota

*Minneapolis Children's Health Center and Hospital, Minneapolis, Minnesota.

Rheumatic Diseases

YOUR SUBCOMMITTEE on rheumatic disease of the Minnesota Medical Association is sponsoring a monthly "Rheumatology Corner" starting with the July, 1978 issue. The articles will briefly review pertinent topics in rheumatic disease commonly seen in the general practice of medicine. Updating and introduction to recent or new concepts, and advances in rheumatology will be presented.

Initial articles will address the rationale of diagnosis and treatment in connective tissue disease, joint examination, synovial analysis, natural course of rheumatoid arthritis, systemic complications of rheumatoid disease, and the diagnosis of rheumatoid arthritis. Subsequent articles will address treatment programs. Additional topics to follow will be crystal synovitis, other problems in diagnosis and treatment of connective tissue diseases, and testing in rheumatic diseases.

It is hoped that this will be an ongoing review of rheumatology for the clinician. This feature of MINNESOTA MEDICINE is directed to the practicing physician, and the subcommittee on rheumatic disease is anxious to respond to suggestions and constructive criticisms of the readers.

Roger S. Colton, M.D.
St. Paul, Minnesota
Harvinder Luthra, M.D.
Rochester, Minnesota
Gerald Mullin, M.D
Minneapolis, Minnesota

Cover Photograph
"Bluebells"

The cover presentation is a closeup of the flowers of *Mertensia virginica,* commonly called a bluebell or Virginia cowslip. It is a spring flower found in rich, deciduous woods in Southeastern Minnesota. A Miranda Sensorex II with a 50 mm lens and extension tubes (16 mm) at 1/60 sec., f8 was used. The film was Kodachrome 64.

Ann McKenzie, a junior at the Mayo Medical School in Rochester, took the picture in mid-May in the afternoon near Redding's Mill, Houston, Minnesota, where the bluebells are found in great abundance. She tells the editors that she found herself competing with hungry hummingbirds for the flowers.

The study of wildlife, particularly that of Minnesota, is a passion of Ann McKenzie and her husband, a high school science teacher. They not only take pictures but take high school students on field trips throughout Minnesota and neighboring states.

She plans to graduate in 1979 and take a residency in Family Practice.

History

Medical Writings of a Literary Physician
Sir Arthur Conan Doyle (1859-1930)

JACK D. KEY*

Discussed are Arthur Conan Doyle's formal contributions to the medical literature. This is a subject about which very little has been written.

THE LITERARY writings of Arthur Conan Doyle can be recommended to all who are involved in the health sciences. His stories are liberally laced with references to matters of medical and scientific interest. As one reads through the adventures of Sherlock Holmes, Dr. Watson, and other Doyle-composed masterpieces, it is obvious that the stories are written by a person well versed in medicine with its tenet of careful clinical observation. Something seems to be included for everyone with many examples of contemporary British medical practices relating to anatomy, cardiology, chemistry, dermatology, forensic science, genetics, internal medicine, neurology, ophthalmology, otorhinolaryngology, pathology, pharmacology, physiology, psychiatry, surgery, toxicology, tropical medicine, and more. The medical references are neither trivial nor contrived but occur naturally in their places as commentaries on events as they happen — descriptions by a doctor as seen through his eyes.

My intent with this paper is to make a brief presentation of Doyle as a physician and to note his formal contributions to the medical literature. Since his formal medical writings were meager and are difficult to find, perhaps Doylean devotees will consider the subsequently reproduced examples of his strictly medicine-related efforts of value.

Arthur Conan Doyle, creator of Sherlock Holmes, was born in Edinburgh, Scotland, on May 22, 1859. His mother, concerned that he have a means of livelihood, advised Arthur to go to medical school. This he did after preliminary education at the Jesuit College at Stoneyhurst, Lancashire, England. Doyle graduated from the Edinburgh University in 1881 with the degrees of Bachelor of Medicine and Master of Surgery.

Contributing to his reservoir of experiences in these early years (much of which was subsequently incorporated into novels) were two brief sea voyages as ship's surgeon, first to the Arctic on a whaler and later to the west coast of Africa, and several short tours of duty as an assistant to doctors in England. Early in 1882 he became assistant to George Budd, an old medical school colleague, in Plymouth, England. This experience proved disappointing and shortly thereafter Doyle put up his own brass plate at Southsea. His practice during the next 8 years developed slowly — too slowly. Doyle then decided to become an eye specialist and in December 1890, he left for Vienna to study.

It is interesting to note at this point an excerpt from Doyle's *The Stark Munro Letters*, which is something of an autobiographical volume of his time spent with George Budd. In a conversation between Stark Munro (Doyle) and Cullingworth (Budd), the following comment appears:

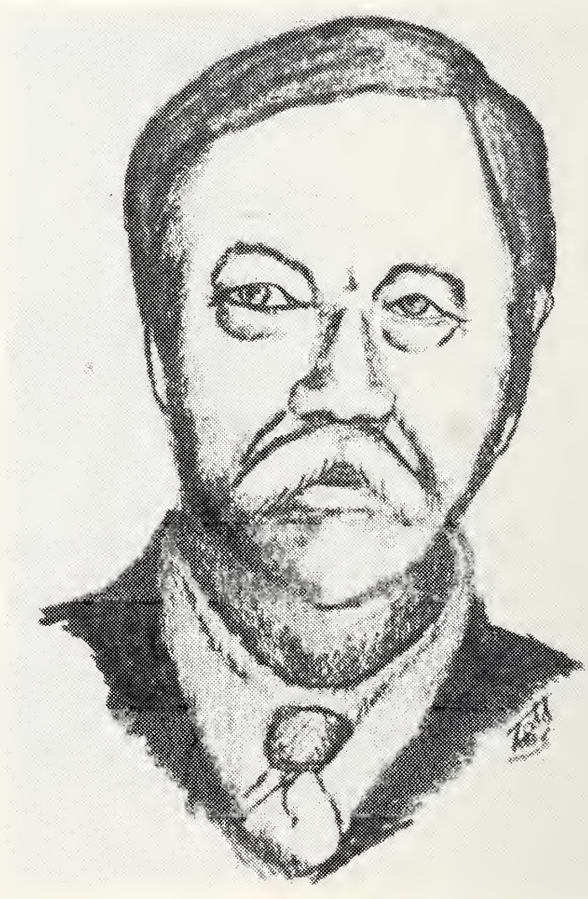


Fig. 1.—Arthur Conan Doyle (1859-1930): Medical Author.

*Librarian, Mayo Clinic, Rochester, Minnesota

I've taken to the eye, my boy. There's a fortune in the eye. A man grudges a half-crown to cure his chest or his throat, but he'd spend his last dollar over his eye. There's money in ears, but the eye is a gold mine!

Another example of Doyle's thoughts on ophthalmology as a career appears in a letter he wrote to his sister. One also sees the hint of ambivalence concerning the financial role literature was soon to play in his destiny.

If it *(Micah Clarke)* comes off, we may have a few hundreds to start us. I should go to London and study the eye. I should then go to Berlin and study the eye. I should then go to Paris and study the eye. Having learned all there is to know about the eye, I should come back to London and start as an eye-surgeon, still, of course, keeping literature as my milk-cow.

Returning from the Continent in 1891, Doyle set up practice in London among the fashionable practitioners at Devonshire Place — but saw no patients.

Doyle at this same time survived a severe bout of influenza and made up his mind to turn to full-time writing. Royalties from his books and checks for his short stories and other writings were pouring in. It was evident to him that what had started modestly with the sale of his first story in 1878 had subsequently, with many other publications, grown to an enjoyable and comfortable occupation. He would turn to medicine again only while treating British soldiers in the Boer War in South Africa, a service for which he was knighted in 1902.

Altogether Dr. Doyle's medical activities covered a period of a little over 10 years. A career in medicine originally undertaken for practical purposes seemingly provided few of the hoped-for rewards. Perhaps the real answer to why Doyle did not make a greater impact on his chosen profession was that he lacked a genuine impetus toward medicine. In any case, Doyle's gift for literary writing emerged as his predominant activity.

One would think that Doyle, a born writer, might have contributed much to the formal literature of medicine. Circumstances, talent, and history were to dictate otherwise. In 1878, while he was yet a medical student, he wrote optimistically to his mother:

Let me once get my footing in a good hospital and my game is clear. Observe cases minutely, improve in my profession, write to the *Lancet,* supplement my income by literature, make friends and conciliate everyone I meet, wait ten years if need be, and then when my chance comes be prompt and decisive in stepping into an honorary surgeonship.

Doyle's first effort, "Gelseminum as a Poison," appeared in the September 1879 issue of the *British Medical Journal* as a letter to the editor. He described an experiment conducted on himself, his symptoms and his reactions to gradually increasing doses of gelseminum over a seven-day period (Figure 2).

His second contribution appeared in *Lancet* in

GELSEMINUM AS A POISON.

SIR,—Some years ago, a persistent neuralgia led me to use the tincture of gelseminum to a considerable extent. I several times overstepped the maximum doses of the text-books without suffering any ill effects. Having recently had an opportunity of experimenting with a quantity of the fresh tincture, I determined to ascertain how far one might go in taking the drug, and what the primary symptoms of an overdose might be. I took each dose about the same hour on successive days, and avoided tobacco or any other agent which might influence the physiological action of the drug. Here are the results as jotted down at the time of the experiment. On Monday and Tuesday, forty and sixty minims produced no effect whatever. On Wednesday, ninety minims were taken at 10.30. At 10.50, on rising from my chair, I became seized with an extreme giddiness and weakness of the limbs, which, however, quickly passed off. There was no nausea or other effect. The pulse was weak but normal. On Thursday, I took 120 minims. The giddiness of yesterday came on in a much milder form. On going out about one o'clock, however, I noticed for the first time that I had a difficulty in accommodating the eye for distant objects. It needed a distinct voluntary effort, and indeed a facial contortion to do it.

On Friday, 150 minims were taken. As I increased the dose, I found that the more marked physiological symptoms disappeared. To-day, the giddiness was almost gone, but I suffered from a severe frontal headache, with diarrhœa and general lassitude.

On Saturday and Sunday, I took three drachms and 200 minims. The diarrhœa was so persistent and prostrating, that I must stop at 200 minims. I felt great depression and a severe frontal headache. The pulse was still normal, but weak.

From these experiments I would draw the following conclusions.

1. In spite of a case described some time ago in which 75 minims proved fatal, a healthy adult may take as much as 90 minims with perfect immunity.

2. In doses of from 90 to 120 minims, the drug acts apparently as a motor paralyser to a certain extent, causing languor, giddiness, and a partial paralysis of the ciliary muscle.

3. After that point, it causes headache, with diarrhœa and extreme lassitude.

4. The system may learn to tolerate gelseminum, as it may opium, if it be gradually inured to it. I feel convinced that I could have taken as much as half an ounce of the tincture, had it not been for the extreme diarrhœa it brought on.

—Believe me, yours sincerely,
A. C. D.

Clifton House, Aston Road, Birmingham.

Fig. 2. — British Medical Journal September 20, 1879, p. 483

NOTES ON A CASE OF LEUCOCYTHÆMIA.

To the Editor of THE LANCET.

SIR,—As the causation of this rare and curious disease has been as obscure hitherto as its treatment has been futile, your readers may be interested by a case which seems to throw some light upon both points.

The patient, a well-built man, twenty-nine years of age, came to my friend Mr. Hoare complaining of a large tumour, which extended across his abdomen from the right costal border to the left anterior superior spine of the ilium. This proved upon examination to be an enormously hypertrophied spleen, the hilum being represented by a deep notch a little above the level of the umbilicus. The account of the patient was that some years before he had had a sharp attack of ague at Aspinwall, on the American coast, and that he had never entirely shaken off its effects. The swelling, however, had appeared recently, and attained its large proportions in the course of a few weeks. On examining the blood under the microscope we found that the leucocytes were enormously increased in number, almost filling up the interspaces of the rouleaux, while the coloured corpuscles were ill-formed, and diminished not only relatively, but also in the aggregate. The proportion of white to red was calculated at one to seven. None of the other blood glands were affected, and the only symptoms complained of were referable to pressure of the tumour, principally dyspepsia and vomiting from its interference with the stomach, and pain in the legs from compression of the lumbar plexus. The liver was slightly enlarged and tender, but the secretion of bile appeared to be unaffected. The heart was weak and had a well-marked functional murmur. Excessive marasmus was another leading feature of the case, the patient having fallen from fourteen to eleven stone in a few weeks. Having given both iron and quinine a fair trial, and found them equally inefficacious, we have now had recourse to arsenic in large doses, in combination with the iodide and chlorate of potash. This mode of treatment, combined with a liberal diet, and strict attention to the state of the bowels, has been remarkably efficacious. The tumour has already diminished in size, and some of the more distressing secondary symptoms have been alleviated. The principal interest of the case lies, I think, in the connexion to be traced between the malarious poison and the subsequent leucocythæmia, a connexion which seems to show that this obscure disease is intimately allied to ordinary "ague-cake," if not a mere modification of that pathological condition, determined by some idiosyncrasy of constitution or temperament.

I am, Sir, your obedient servant,

Aston, March, 1882. A. COWAN DOYLE, M.B., C.M. EDIN.

Fig. 3.—Lancet March 25, 1882, p. 490.

March 1882 (Figure 3). In this article, entitled "Notes on a Case of Leucocythaemia," Doyle suggested a connection between malaria and leukemia. There is little to mark it as being outstanding or anything other than just another case report. Note the uncharitable finger of fate that can haunt any author. His name was misspelled A. Cowan Doyle instead of A. Conan Doyle.

The third contribution, "The Remote Effects of Gout," published in *Lancet* in November 1884, is another case report, noting gout in three successive generations of the same family (Figure 4).

While serving in the Boer War at the Langman Hospital in South Africa, Doyle responded to a suggestion from the editor of the *British Medical Journal* to send in notes on anything that might be of interest. He followed through on this suggestion with "The War in South Africa, The Epidemic of Enteric Fever at Bloemfontein," which appeared in the *British Medical Journal* in July 1900. What he wrote was a vivid description of the toll taken by the disease and of the courage, patience, and hard work displayed by those involved (Figure 5).

Not qualifying for replication in this article (insomuch as they do not appear in the published medical literature or are otherwise not too important) but as comments necessary to make my story complete are the following:

1. In 1885 Doyle, after hard study at home, passed the examination and qualified for the M.D. degree, which was awarded to him by Edinburgh University. In partial fulfillment of the requirements for this degree an unpublished doctoral thesis was presented entitled

THE REMOTE EFFECTS OF GOUT.

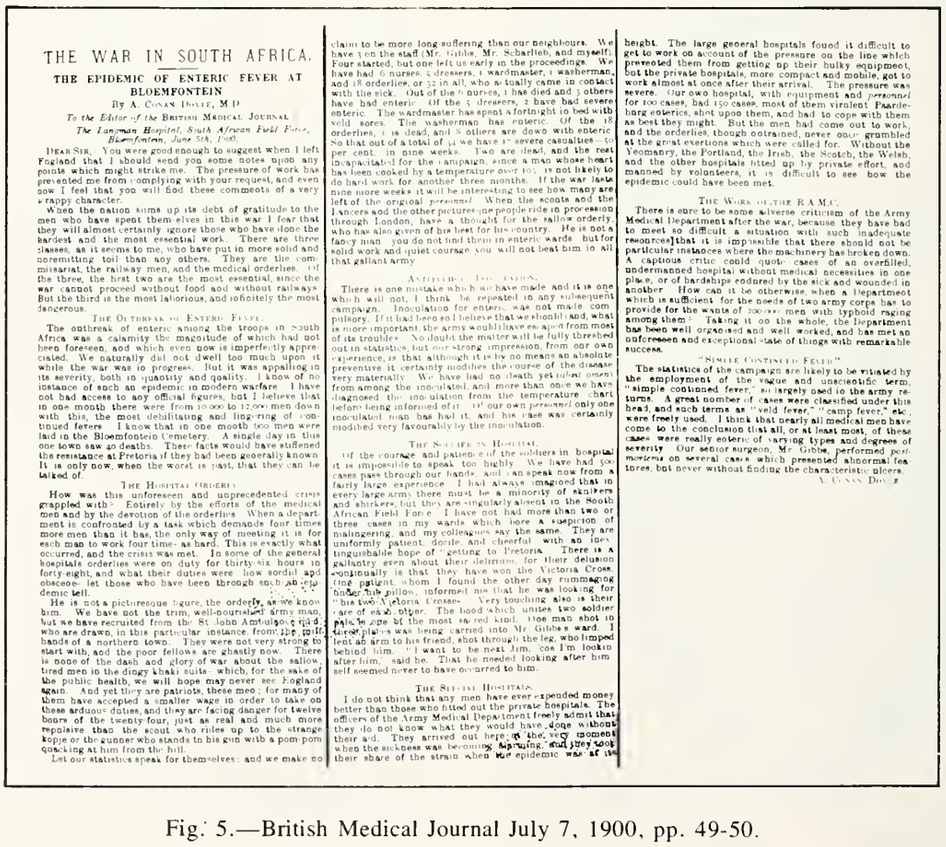
To the Editor of THE LANCET.

SIR,—I read with much interest the description of the relation of certain diseases of the eye to gout, as reported last week in THE LANCET. Mr. Hutchinson has remarked in his lecture on the obscure non-arthritic effects which gout may produce in the children of gouty parents, without any ordinary gouty symptoms. I have had two cases lately in my practice which illustrate his remarks so well that I cannot forbear from quoting them. A Mr. H—— came to me suffering from chronic eczema and psoriasis. He attributed it himself to the great changes of temperature and profuse perspirations incidental to his business. I put him on arsenic and afterwards on iodide of potash, without much benefit. He told me that he had never had any gouty symptoms in his life. Shortly afterwards his married daughter, Mrs B——, consulted me on certain intense pains in her eyes, accompanied by temporary congestion and partial blindness, which attacked her whenever her digestion was deranged. Recognising this to be a gouty symptom, and bethinking me of the obscure skin disease which afflicted the father, I made somewhat minute inquiries into the previous family history. I then found that the grandfather of Mrs. B—— and the father of Mr. H—— had been a martyr to gout for many years, and had eventually died of a form of Bright's disease, which I have no doubt from the description was the "contracted granular kidney" so intimately associated with gout.

These cases are, I think, interesting as showing the protean character of the disease, extending over three generations. The grandfather was thoroughly gouty; the father had skin affections without any other gouty symptom; the third generation exhibited eye symptoms and nothing else. I may mention that both cases improved rapidly upon colchicum and alkalies.—Yours sincerely,

Southsea, Nov. 24th, 1884. A. CONAN DOYLE, M.B., C.M.

Fig. 4.—Lancet November 29, 1884, pp. 978-979.



THE WAR IN SOUTH AFRICA.

THE EPIDEMIC OF ENTERIC FEVER AT BLOEMFONTEIN

By A. CONAN DOYLE, M.D.

To the Editor of the BRITISH MEDICAL JOURNAL

The Langman Hospital, South African Field Force, Bloemfontein, June 5th, 1900.

DEAR SIR, You were good enough to suggest when I left England that I should send you some notes upon any points which might strike me. The pressure of work has prevented me from complying with your request, and even now I feel that you will find these comments of a very scrappy character.

When the nation sums up its debt of gratitude to the men who have spent themselves in this war I fear that they will almost certainly ignore those who have done the hardest and the most essential work. There are three classes, as it seems to me, who have put in more solid and unremitting toil than any others. They are the commissariat, the railway men, and the medical orderlies. Of the three, the first two are the most essential, since the war cannot proceed without food and without railways. But the third is the most laborious, and infinitely the most dangerous.

THE OUTBREAK OF ENTERIC FEVER.

The outbreak of enteric among the troops in South Africa was a calamity the magnitude of which had not been foreseen, and which even now is imperfectly appreciated. We naturally did not dwell too much upon it while the war was in progress. But it was appalling in its severity, both in quantity and quality. I know of no instance of such an epidemic in modern warfare. It has not had access to any official figures, but I believe that in one month there were from 10,000 to 12,000 men down with this, the most debilitating and lingering of continued fevers. I know that in one week 600 men were laid in the Bloemfontein Cemetery. A single day in this one town saw 40 deaths. These facts would have stiffened the resistance at Pretoria if they had been generally known. It is only now, when the worst is past, that they can be talked of.

THE HOSPITAL ORDERLY.

How was this unforeseen and unprecedented crisis grappled with? Entirely by the efforts of the medical men and by the devotion of the orderlies. When a department is confronted by a task which demands four times more men than it has, the only way of meeting it is for each man to work four times as hard. This is exactly what occurred, and the crisis was met. In some of the general hospitals orderlies were on duty for thirty-six hours in forty-eight, and what their duties were how sordid and obscene let those who have been through such an epidemic tell. . . . . .

He is not a picturesque figure, the orderly, as we know him. We have not the trim, well-nourished army man, but we have recruited from the St. John Ambulance and, who are drawn, in this particular instance, from the poorer hands of a northern town. They were not very strong to start with, and the poor fellows are ghastly now. There is none of the dash and glory of war about the sallow, tired men in the dingy khaki suits, which, for the sake of the public health, we will hope may never see England again. And yet they are patriots, these men; for many of them have accepted a smaller wage in order to take on these arduous duties, and they are facing danger for twelve hours of the twenty-four, just as real and much more repulsive than the scout who rides up to the strange kopje or the gunner who stands in his gun with a pom-pom cracking at him from the hill.

Let our statistics speak for themselves; and we make no claim to be more long-suffering than our neighbours. We have 100 the staff (Mr. Gibbs, Mr. Scharlieb, and myself). Four started, but one left us early in the proceedings. We have had 6 nurses, 5 dressers, 1 wardmaster, 1 washerman, and 18 orderlies, or 32 in all, who actually came in contact with the sick. Out of the 6 nurses, 1 has died and 3 others have had enteric. Of the 5 dressers, 2 have had severe enteric. The wardmaster has spent a fortnight in bed with veld sores. The washerman has enteric. Of the 18 orderlies, 1 is dead, and 8 others are now with the sick. So that out of a total of 32 we have 12 severe casualties—to per cent. in nine weeks. Two are dead, and the rest incapacitated for the campaign, since a man whose heart has been cooked by a temperature over 103 is not likely to do hard work for another three months. If the war lasts nine more weeks it will be interesting to see how many are left of the original *personnel*. When the scouts and the Lancers and the other pictures[ue people ride in procession through London, have a thought for the sallow orderly, who has also given of his best for his country. He is not a fancy man—you do not find them in enteric wards—but for solid work and quiet courage you will not beat him in all that gallant army.

ANTITYPHOID INOCULATION.

There is one mistake which we have made and it is one which will not, I think, be repeated in any subsequent campaign. Inoculation for enteric was not made compulsory. If it had been so I believe that we should have, what is more important, the army wouldn't have escaped from most of its troubles. No doubt the matter will be fully threshed out in statistics, but our strong impression, from our own experience, is that although it is by no means an absolute preventive it certainly modifies the course of the disease very materially. We have had no death yet [illegible] whom has been inoculated, and more than once we have diagnosed the inoculation from the temperature chart before being informed of it. Of our own *personnel* only one inoculated man has had it, and his case was certainly modified very favourably by the inoculation.

THE SOLDIER IN HOSPITAL.

Of the courage and patience of the soldiers in hospital it is impossible to speak too highly. We have had 500 cases pass through our hands, and I can speak now from a fairly large experience. I had always imagined that in every large army there must be a minority of skulkers and shirkers, but they are singularly absent in the South African Field Force. I have not had more than two or three cases in my wards which bore a suspicion of malingering, and my colleagues say the same. They are uniformly patient, docile, and cheerful with an inexhaustible hope of "getting to Pretoria." There is a gallantry even about their delirium, for their delusion continually is that they have won the Victoria Cross. One patient, whom I found the other day rummaging under his pillow, informed me that he was looking for "his two Victoria Crosses." Very touching also is their care of each other. The hood which unites two soldier patients is one of the most marked kind. One man shot in the left [illegible] was being carried into Mr. Gibbs's ward. He held up his arm to his friend, shot through the leg, who limped behind him. "I want to be next Jim, cos I'm lookin after him," said he. That he needed looking after himself seemed never to have occurred to him.

THE SECOND HOSPITAL.

I do not think that any men have ever expended money better than those who fitted out the private hospitals. The officers of the Army Medical Department freely admit that they do not know what they would have done without their aid. They arrived out here at the very moment when the sickness was becoming appalling, and they took their share of the strain when the epidemic was at its height. The large general hospitals found it difficult to get to work on account of the pressure on the line which prevented them from getting up their bulky equipment, but the private hospitals, more compact and mobile, got to work almost at once after their arrival. The pressure was severe. Our own hospital, with equipment and *personnel* for 100 cases, had 150 cases, most of them virulent Paardeberg enterics, shot upon them, and had to cope with them as best they might. But the men had come out to work, and the orderlies, though untrained, never once grumbled at the great exertions which were called for. Without the Yeomanry, the Portland, the Irish, the Scotch, the Welsh, and the other hospitals fitted up by private effort, and manned by volunteers, it is difficult to see how the epidemic could have been met.

THE WORK OF THE R.A.M.C.

There is sure to be some adverse criticism of the Army Medical Department after the war, because they have had to meet so difficult a situation with such inadequate resources[that it is impossible that there should not be particular instances where the machinery has broken down. A captious critic could quote cases of an overfilled, undermanned hospital without medical necessities in one place, or of hardships endured by the sick and wounded in another. How can it be otherwise when a Department which is sufficient for the needs of two army corps has to provide for the wants of 200,000 men with typhoid raging among them? Taking it on the whole, the Department has been well organised and well worked, and has met an unforeseen and exceptional state of things with remarkable success.

"SIMPLE CONTINUED FEVER."

The statistics of the campaign are likely to be vitiated by the employment of the vague and unscientific term, "simple continued fever," so largely used in the army returns. A great number of cases were classified under this head, and such terms as "veld fever," "camp fever," etc. were freely used. I think that nearly all medical men have come to the conclusion that all, or at least most, of these cases were really enteric of varying types and degrees of severity. Our senior surgeon, Mr. Gibbs, performed *post-mortems* on several cases which presented abnormal features, but never without finding the characteristic ulcers.

A. CONAN DOYLE.

Fig. 5.—British Medical Journal July 7, 1900, pp. 49-50.

"The Gouty Diathesis."

2. In 1890 Doyle made a trip to Berlin and thereafter published a letter of warning in the *Daily Telegraph* concluding that Robert Koch's tuberculin, being touted as a sure cure for consumption, was both experimental and premature.

3. In *Lancet* 1:189, Jan. 19, 1907, and in the *British Medical Journal* 1:173, Jan. 19, 1907, Doyle, in letters to the editors, submitted a question for ophthalmologists concerning the case of George Edalji, who was found guilty of having mutilated a pony. In the cause of justice, Doyle sought a consensus of scientific opinion as to whether it was physically possible for Mr. Edalji, who had severe myopic astigmatism, to have committed this offense. Also in 1907 he wrote the foreword for *The Construction and Reconstruction of the Human Body* . . . by E. Sandow, published in London by John Bale, Sons & Co.

4. To the entering medical class at St. Mary's Hospital in 1910, Doyle presented an interesting talk titled "The Romance of Medicine." A recorder apparently transcribed this address, which appears in *Lancet* 2:1066-1068, 1910. Doyle's message was that training in medicine was both a valuable and a worthwhile background for any profession. He discussed the undue materialism of the period, warned against intellectual priggishness, and stressed the values of kindliness, humanity, and knowledge.

5. Doyle's final publication in the medical literature appears as an obituary for Captain Malcolm Leckie, D.S.O., R.A.M.C., in *Guy's Hospital Gazette* (London), volume 29, pages 3-4, January 2, 1915. Leckie, formerly of Guy's Hospital, died of wounds on August 28th at Frameries near Mons. He was attached to the Northumberland Fusiliers and had gone to the front with the Expeditionary Army.

6. Of Doyle's literary writings only *Round the Red Lamp, Being Facts and Fancies of Medical Life*, published in 1895, in general, is of a medical nature. This work, a collection of short stories, is based on the common theme of a doctor's life. In these stories the author proved that his knowledge of medicine was based on more than hearsay and that he was acutely aware of the essential qualities of the good physician.

Conan Doyle was proud of the fact that he was a physician. In a letter to his mother he once mentioned "The title I value most is that of 'Doctor,' which was conferred by your self-sacrifice and determination." Years later at a tea he hosted in July 1913 for Representatives of the Medical Association, Doyle observed that "he had the warmest feelings towards his old profession, and that the opportunity of renewing acquaintances with his old colleagues and entertaining them at tea was a source of great pleasure to him." He achieved eminence in another walk of life, but he was always willing to acknowledge generously his indebtedness to his former profession. At the same time, Doyle recognized that he had no possible claim to be regarded as a success in medicine. At the 1913 tea for Representatives of the Medical Profession, Doyle wryly recalled that once in America the chairman at a dinner at which he was present remarked "that it was a sinister fact that although Sir Arthur Conan Doyle was supposed to be a doctor no living patient of his had ever been seen."

The ultimate loss to the medical profession as Doyle spent fulltime on his avocation is uncertain. The gain to literature, however, was tremendous. A versatile Doyle firmly established himself in English literature not only with mysteries, crime, and detective fiction but also with historical novels, short stories, volumes of poems, plays, histories, science fiction, and publications in occult science. He invented the most famous detective — Sherlock Holmes. He enriched our lives. Conan Doyle — the man — died July 7, 1930; Conan Doyle — the author — lives on in the minds and hearts of multitudes. Appropriate is the epitaph that marks his grave: "Arthur Conan Doyle, Knight, Born May 22, 1859, Steel True, Blade Straight."

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Laboratory Letter

Causation of Sudden Infant Death Syndrome

RALPH A. FRANCIOSI, M.D.*

A hypothesis is presented which correlates pecularities of the upper airway and sleep state in young infants to explain S.I.D.S. Documentation of predisposing prenatal, natal and post-natal factors which alter infant survival reflexes might allow infants at risk for S.I.D.S. to be predicted.

SUDDEN INFANT DEATH Syndrome (S.I.D.S.) is the sudden and unexplained death of an infant in whom no conventionally accepted cause is ascertained after reviewing the circumstances of death and performing a complete post-mortem examination.[1] The circumstances of death are characteristic i.e., 99% of infants less than one-year-of-age (90% ≤ six months); occurrence during sleep and hypoxia. Since the cause(s) is not known the definition is not contingent upon cause. Indeed, the lack of a known cause is not unique to S.I.D.S. e.g., Reye's Syndrome. The clinical circumstances combined with non-specific pathologic alterations are sufficient to apply the designation Reye's Syndrome. Upon reflection we can realize that if classification of disease is based only on cause then insights into many disease processes would be impeded.

Causation

The characteristic circumstances of S.I.D.S. are: age, sleep and hypoxic death. Because S.I.D.S. cases are managed differently geographically there is concern that certain explained causes of death might be mis-labeled as S.I.D.S. e.g., infanticide. This concern is justified when applied to all S.I.D.S. deaths, however, the suspicion is unwarranted when a qualified death investigation team establishes the diagnosis.

Many theories have been proposed to explain S.I.D.S.[1] It is becoming apparent that the death results from a complex series of events that cause irreversible hypoxia. Evaluation of these events is severely limited by our ignorance of developmental biology in infants. I feel that the pecularity of the upper respiratory tract in infancy is critical to understanding S.I.D.S. The young infant depends on the nasal passages for aeration during sleep. Although mouth breathing is an alternative route for many infants, it is not the "normal" route. Anatomically, the diameters of the nasal passages range from 0.2 to 0.5 cm. (per side) in infants from birth to 6 months of age. The nasopharynx is approximately 1 ml. Enlargement of the tonsils and adenoids begins at 1 month of age and reduces the volume of the nasopharynx. The tongue, particularly the posterior portion, is in apposition to the soft palate and essentially occludes much of the oropharynx.[2] The coordination of swallowing and breathing is a complex and essential reflex.

The nasal mucosa has neural receptors which supply afferent pathways to the brain stem.[3] The efferent pathways influence the tracheobronchial tree and heart, i.e., bronchospasm and bradycardia. Stimulation of the nasal mucosa by allergens, microorganisms and temperature change results in mucosal edema and/or secretion. It is apparent that mucosal edema causes stenosis, however, liquid or dried secretions impede air passage. The systemic effects of nasal stimulation are best seen in diving animals e.g. seals, and consists of: bradycardia, apnea and hypertension.[4] The diving reflex is a primitive reflex which is present in infants and allows human divers to submerge.

Steinschneider[5] has documented the occurrence of respiratory pauses during sleep in infants. Some pauses are prolonged and classified as apnea. Sleep apnea is prolonged by an upper respiratory infection.[6] Shannon and Kelly[7] have studied infants with recurrent sleep apnea and noted impaired regulation of alveolar ventilation. During rapid eye movement (REM) sleep, there is an inhibition of muscle tone e.g., tongue, soft palate and pharynx.[8,9] These physiologic alterations in sleep, in addition to the anatomic and physiologic pecularities of the upper airway seem to explain the hypoxic death noted in S.I.D.S.

*Director of Minnesota Sudden Infant Death Syndrome Program and Director of Laboratories, Children's Health Center and Hospital, Minneapolis.

S.I.D.S. research has recently focused on the association between prenatal, natal and post-natal factors and S.I.D.S.[10] These factors include: maternal smoking, premature birth, low Apgar scores, neonatal respiratory distress, thermal instability, hyperbilirubinemia and apnea. I would speculate that this complex grouping of factors could interfere with the development of "normal survival reflexes" and hence place an infant at risk for S.I.D.S.

Conclusion

1. S.I.D.S. is a definable disease entity.
2. Pecularities of the upper airway (anatomic and physiologic), combined with physiologic changes during sleep (sleep apnea, muscle relaxation) can cause S.I.D.S.
3. Prenatal, natal and post-natal factors can interfere with the development of normal survival reflexes in infants.

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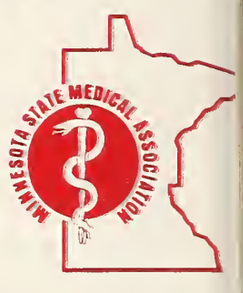
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Grand Rounds

Osteosarcoma

Edited by DAVID A. FISCHER, M.D.* and DAVID S. BRADFORD, M.D.†

Guest Discusser: WILLIAM F. ENNEKING, M.D.‡

DAHLIN, in 1967, reported an overall five year survival rate of 20.3% in 408 patients with osteogenic sarcoma.[2] Other reports have shown similar figures.[1,3,6,7] Recent basic and clinical research in orthopaedic surgery, pathology, oncology, and immunology has been directed toward a more thorough understanding of osteosarcoma, the tumor-host relationship, and its sensitivity to chemotherapy. Although surgical ablation remains the stalwart in treatment, hopefully, we can anticipate significantly higher rates of survival through a combination of therapeutic modalities in properly selected patients.[5,8,9,10]

The following case presentations and discussion illustrate a number of current concepts in the diagnosis and treatment of this highly malignant sarcoma of bone.

Case 1

Dr. Karl Pennau#:

A fifteen-year-old girl presented to her local physician complaining of pain in the right knee. This was of recent onset, following minor trauma.

Physical examination was normal except for tenderness at the distal right femur. There was no palpable soft tissue mass and the neuro-vascular status of the limb was normal.

A roentgenogram of the knee revealed a lytic lesion in the distal femur with erosion of the cortex and

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Reprint requests to: Dr. David A. Fischer, Department of Orthopedic Surgery, Hennepin County Medical Center, Minneapolis 55415.



Fig. 1A (left) and 1B (right)—(Case 1) AP and lateral roentgenograms of right knee showing metaphyseal lesion, demonstrating lysis, cortical erosion, and periosteal new bone formation.

periosteal new bone formation (Figures 1A-1B).

All laboratory examinations including a complete blood count, erythrocyte sedimentation rate, serum calcium, and phosphorus were normal. The single abnormal study was an alkaline phosphatase of 577 I.U. (normal 61-220 I.U.). A skin test for immunologic competence was positive for Candida.

A 99mTC polyphosphate bone scan recorded increased uptake in the distal right femur (Figure 1C).

Tomography of the lungs and a liver scan were negative for metastasis.

An open biopsy was performed. The pathologic diagnosis was osteosarcoma.

The patient was begun on chemotherapy following the regimen reported by Rosen;[10] namely vincristine, methotrexate, citrovorum rescue, cyclophosphamide, and adriamycin over a total fifty-six day course. Weekly BCG was begun.

Following completion of a single fifty-six day course of chemotherapy, the alkaline phosphatase had decreased to 324 I.U. but a soft tissue mass posterior to the distal right femur was noted and the patient was admitted to the hospital for surgical treatment. A bone scan at the time of this admission was unchanged except for questionable increased uptake in the right ischium and proximal femur (Figure 1D). Roentgenograms of the proximal femur and pelvis were normal. An arteriogram failed to demonstrate abnormal vasculature in the ischium or proximal femur but revealed a vascular soft tissue mass intimately associated with the femoral artery at the distal femur (Figure 1E). On this basis the decision to do a right hip disarticulation was made and the procedure performed.

Dr. Roby C. Thompson, Jr.*:

Dr. Enneking, does the suggestion of increased uptake in the ischium and proximal femur in the second bone scan (Figure 1D) bother you?

Dr. William Enneking:

Yes it does, although this is very difficult to

*Professor and Chairman, Department of Orthopaedic Surgery, University of Minnesota, Minneapolis, Minnesota.

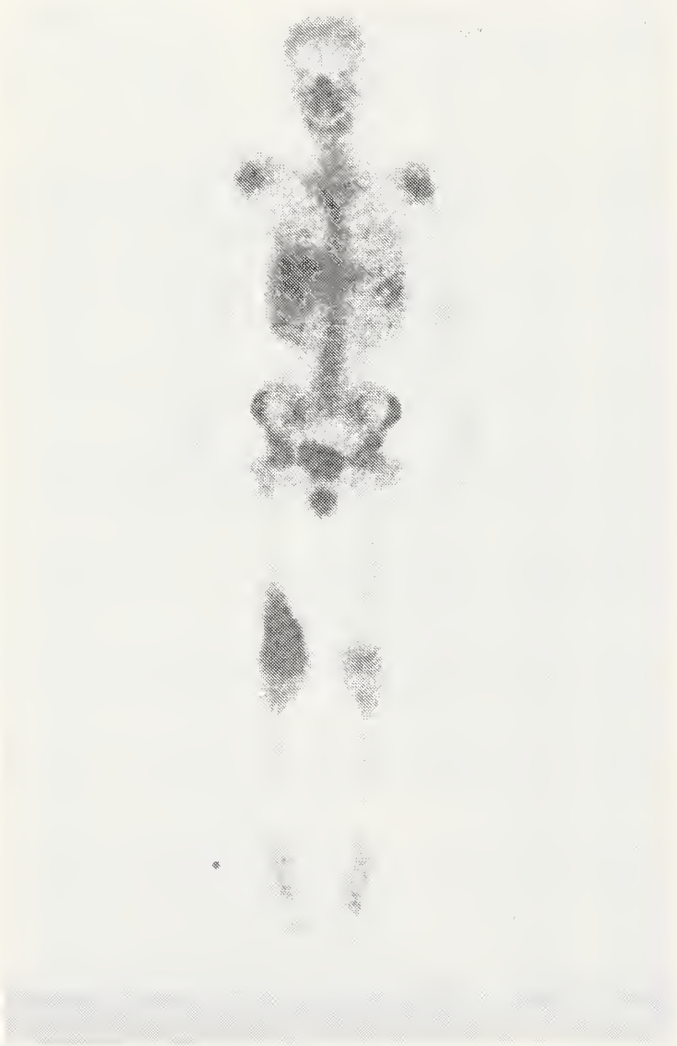


Fig. 1C—(Case 1) Initial 99mTC bone scan demonstrating increased uptake in distal right femur.



Fig. 1D—(Case 1) Preoperative bone scan showing increased uptake, distal right femur and in addition, increased uptake in the right ischium and proximal right femur.

interpret. The abnormal blood flow to the entire limb due to the tumor as well as the non-weight bearing status of the limb, make it impossible to say with any certainty whether this represents additional tumor or not.

Dr. Thompson:

In view of the normal roentgenograms and arteriograms of the ischium and proximal femur, we felt the change on bone scan to be on a vascular basis and not due to additional local tumor.

Dr. Juan Rosai†:

The gross dissection of the amputation specimen revealed a large tumor mass centered in the medullary portion of the lower femoral metaphysis. From here, the tumor extended into the cortex, elevated, and destroyed the periosteum and extended into the soft tissue of the thigh anteriorly and posteriorly (Figure 1F). The tumor had white areas of hard consistency corresponding to foci of osteoid and bone production, alternating with others of necrotic and hemorrhagic appearance. Large hemorrhagic cysts are not uncommon in osteosarcoma; when particularly prominent, a mistaken diagnosis of aneurysmal bone cyst may result. The periosteal elevation with subperiosteal reactive new bone formation seen in the gross specimen is the pathologic counterpart of the "Codman's triangle" described by the radiologist.

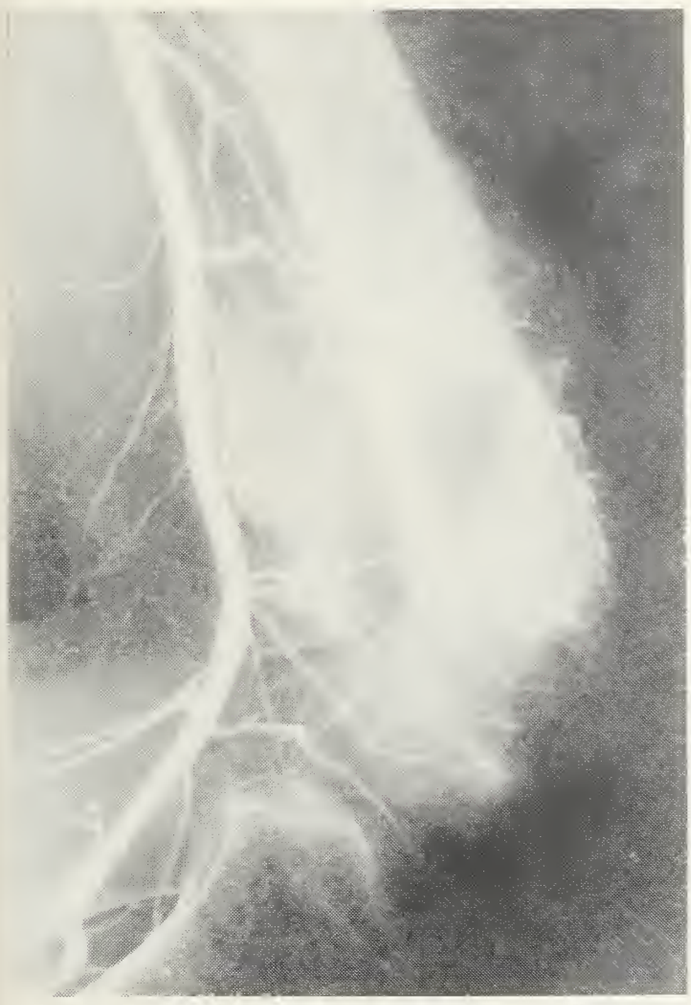


Fig. 1E—(Case 1) Preoperative arteriogram. The tumor mass is closely associated with the femoral artery. Abnormal vasculature is noted anterior to the shaft of the femur as well as posterior.

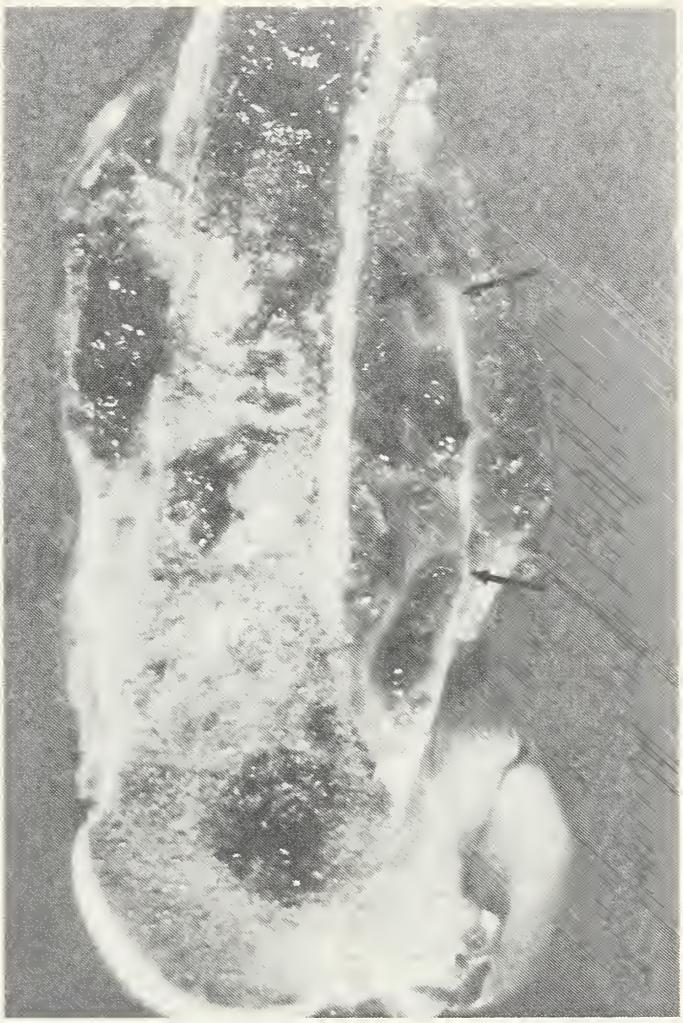


Fig. 1F—(Case 1) Sagittal section of distal right femur and tumor. The tumor has extended into the soft tissues with destruction of the cortex and periosteum.

There was another remarkable gross finding in this case and this consisted of a 1 cm round white-yellowish nodule of firm consistency located in the medullary cavity of the upper end of the same femur at the junction of the metaphysis with the diaphysis (Figure 1G). Under Wood's light, this nodule showed a bright yellow-green fluorescence similar to that exhibited by the main tumor, indicative of tetracycline deposition in the neoformed bone (preoperative tetracycline had been administered).

Microscopically, the main tumor had undifferentiated areas of spindle cell and pleomorphic sarcoma, in which the tumor cells attained a remarkable size. The largest cell we found measured approximately 0.3 mm. That is within the range of resolution of the naked eye (Figure 1H). It is very likely that these cellular aberrations appeared as a

result of chemotherapy that had been administered preoperatively. There were also large foci in which the tumor cells were producing malignant osteoid and bone, thus disclosing their identity as osteoblasts. The pattern of invasion of the cortex by the neoplastic elements was destructive for the most part, resulting in the lytic areas seen radiographically. In others, however, the tumor grew along bone marrow spaces without destroying the pre-existing normal bone trabeculae and actually attaching to their edges in a manner indicative of appositional bone growth (Figure 1i). This diffuse permeation of marrow spaces, which we have seen more often in cases of Ewing's sarcoma and malignant lymphoma, can be completely missed in a roentgenogram because of the preservation of the calcified matrix.

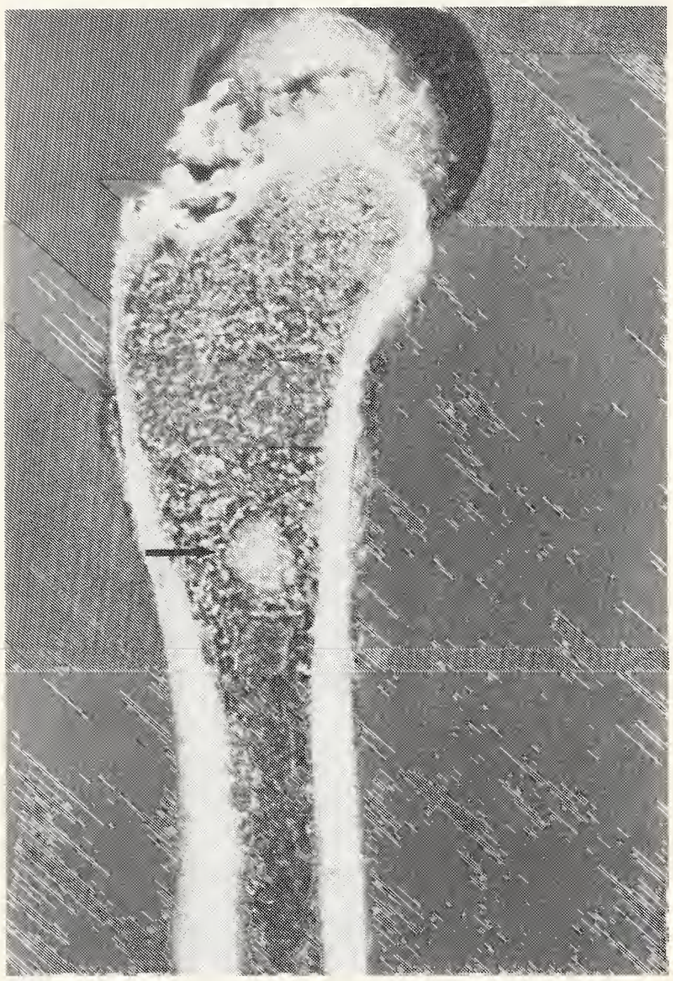


Fig. 1G—(Case 1) "Skip" metastasis in proximal femur.

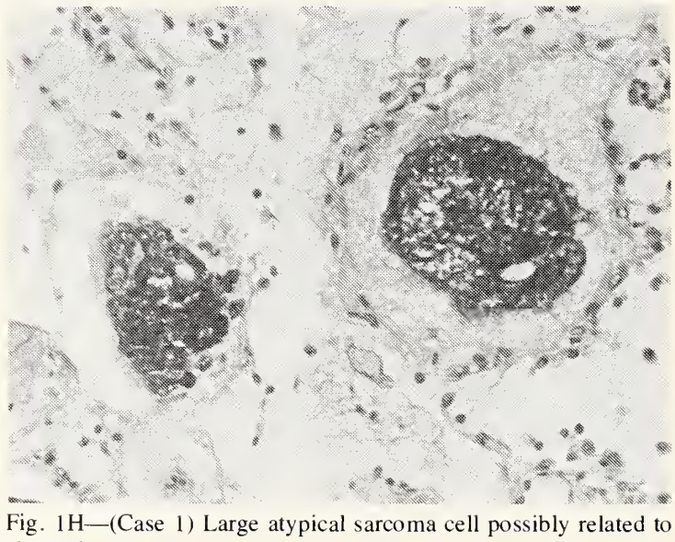


Fig. 1H—(Case 1) Large atypical sarcoma cell possibly related to chemotherapy.

The areas in which the malignant bone was contiguous with the normal one provided a good demonstration of the morphologic difference between the two. In contrast to the homogenously acidophilic tinctorial quality and the smooth edges of its normal counterpart, malignant bone tended to be strongly basophilic, of markedly irregular edges and it often exhibited a reticulated appearance that was highly suggestive of malignancy even in the absence of atypical cells.

This is important to remember because the malignant osteoblasts trapped by the osteoid and bone that they themselves have produced often lack the obvious cytologic atypia present in the malignant osteoblasts found around the newly formed osteoid.

In the area of soft tissue invasion, a medium-sized vein was found with its lumen obliterated by a neoplastic thrombus.

The nodule located in the upper end of the femur was microscopically a focus of osteosarcoma, identical in appearance to the main tumor. Thus, it represented a good example of a "skip metastasis", of the type recently described by Enneking and Kagan.[4] The regional lymph nodes were unremarkable.

Case 2

Dr. John Dowdle*:

A 12-year-old boy presented to his local physician with left shoulder pain after a fall. This had been preceded by about four weeks of shoulder pain. The



Fig. 1i—(Case 1) Diffuse permeation of tumor cells into pre-existing normal bone trabeculae.

initial roentgenogram was interpreted as showing a fracture of the proximal humerus and he was treated with a velpeau splint for four weeks (Figure 2A). Following this he continued to have severe pain and was referred for further evaluation and treatment.

A review of the initial roentgenogram revealed rarefaction of the proximal metaphysis, new bone formation and a questionable soft tissue mass in addition to the fracture.

A roentgenogram taken six weeks later, at the time of referral, showed a large soft tissue mass, new bone formation and destruction of the proximal humerus (Figure 2B).

Physical examination at this time revealed a young male in obvious distress. He was unable to actively move the left shoulder due to pain. An eight centimeter diameter firm mass on the anterior aspect of the proximal left humerus was present. The skin was warm and mottled. The arm was moderately edematous distal to the mass. Severe shoulder pain was present with any attempted motion of the arm.

The laboratory examination was unremarkable with the exception of an alkaline phosphatase of 651 I.U.

A bone scan demonstrated massive increase in uptake of the left proximal humerus (Figure 2C). No

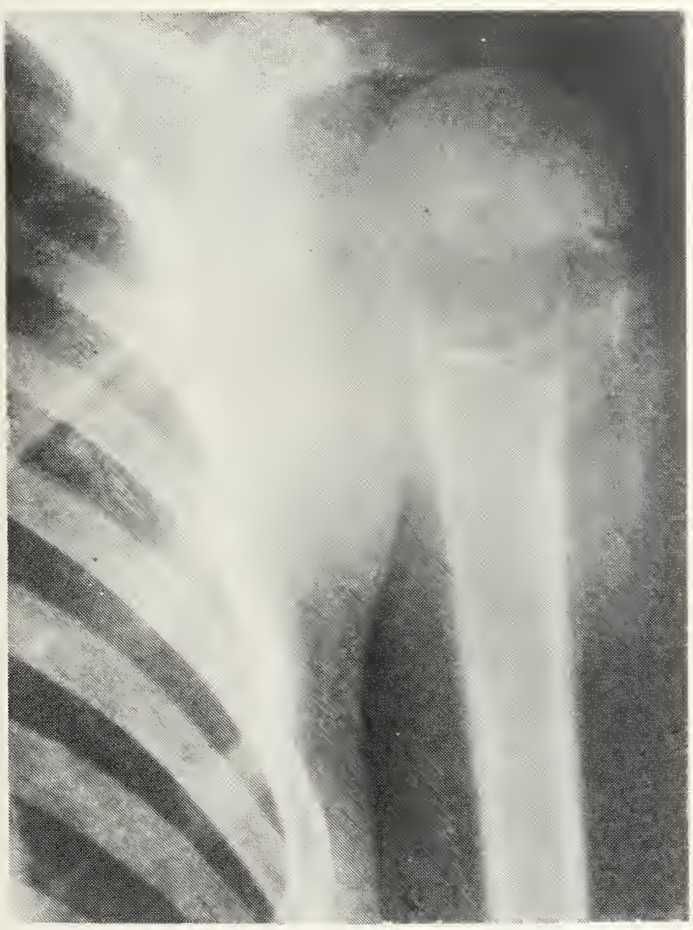


Fig. 2A—(Case 2) Initial roentgenogram of left shoulder showing pathologic fracture of the metaphysis, bone destruction, periosteal elevation and soft tissue mass.

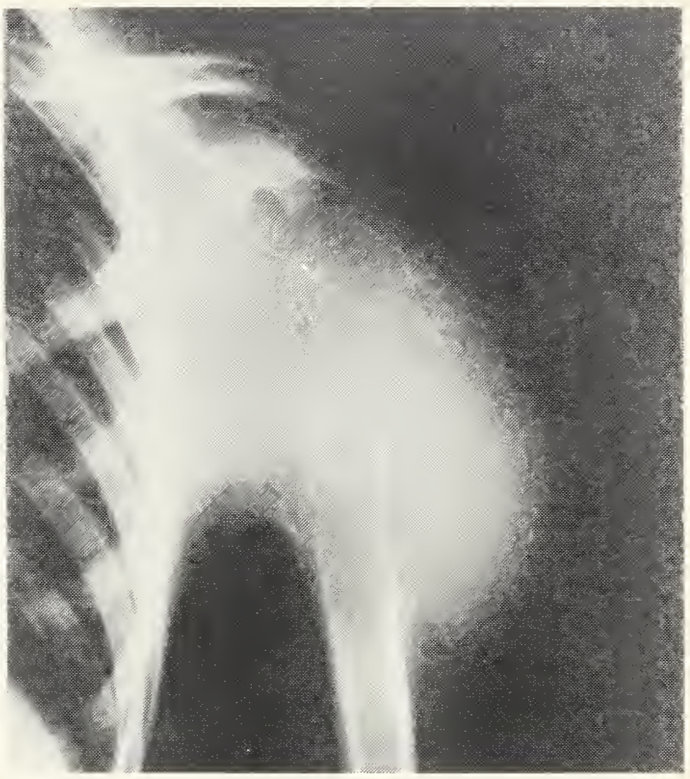


Fig. 2B—(Case 2) Roentgenograms six weeks later. There is increased bony destruction, lysis of proximal humeral shaft, periosteal elevation and new bone formation as well as an extensive soft tissue mass.



Fig. 2C—(Case 2) Bone scan showing markedly increased uptake in the area of the left shoulder.

metastasis was present on lung tomography or liver scan.

A frozen section at the time of biopsy was osteosarcoma and a primary inter-scapular, forequarter amputation was performed during the same anesthetic.

Dr. Rosai:

Dissection of the soft tissues from the amputation specimen and sagital section of the humerus disclosed almost complete destruction of the metaphyseal region of the bone by a highly hemorrhagic neoplasm which was extending into the epiphysis and the surrounding soft tissue (Figure 2D). This massive growth had resulted in a pathologic fracture through the center of the tumor. Although the head of the humerus was markedly invaded by the neoplasm, the articular cartilage was preserved throughout. This is a constant finding whenever invasive tumors encounter cartilaginous tissue, whether they be sarcomas or carcinomas. There is probably no tissue in the human body that is so impervious to invasion by cancer as mature hyaline cartilage, a fact that has intrigued biologists for decades.

Microscopically, the tumor was a typical osteosarcoma, made up of anaplastic foci alternating with others in which osteoid production by the tumor cells was evident (Figure 2E). Tumor thrombi were present within large veins around the soft tissue extension of this osteosarcoma. As expected, the axillary and epitrochlear lymph nodes were not involved.

Dr. Dowdle:

The treatment of the second patient differed from that of the first in two aspects. First, the second patient received no preoperative chemo or immunotherapy. Second, the definitive surgical procedure was performed at the time of biopsy on the basis of the frozen section of the tumor. Post-operatively both received the Rosen regimen of chemotherapy,[10] and in addition, BCG immunotherapy including a vaccine composed of irradiated tumor cells.

Dr. Enneking:

I think you have presented two fairly classic cases of osteosarcoma and I just want to make a few comments about certain parts of the management which remain somewhat controversial and usually cause discussion.

Whether or not to do a biopsy and send the tissue to the pathologist and perform the definitive procedure later on or whether to do a frozen section or open needle biopsy followed by the definitive procedure under the same anesthetic usually arouses some emotion and not a whole lot of light. I do not think there is any statistical evidence one way or the other that the use of vascular obstruction, frozen section, and immediate surgery produces more live children five years later than the opposite. Obviously, when you look at sections of large tumor thrombi in the veins and soft tissue, it seems wrong to incise this, suture it together, and then wait a week for the final

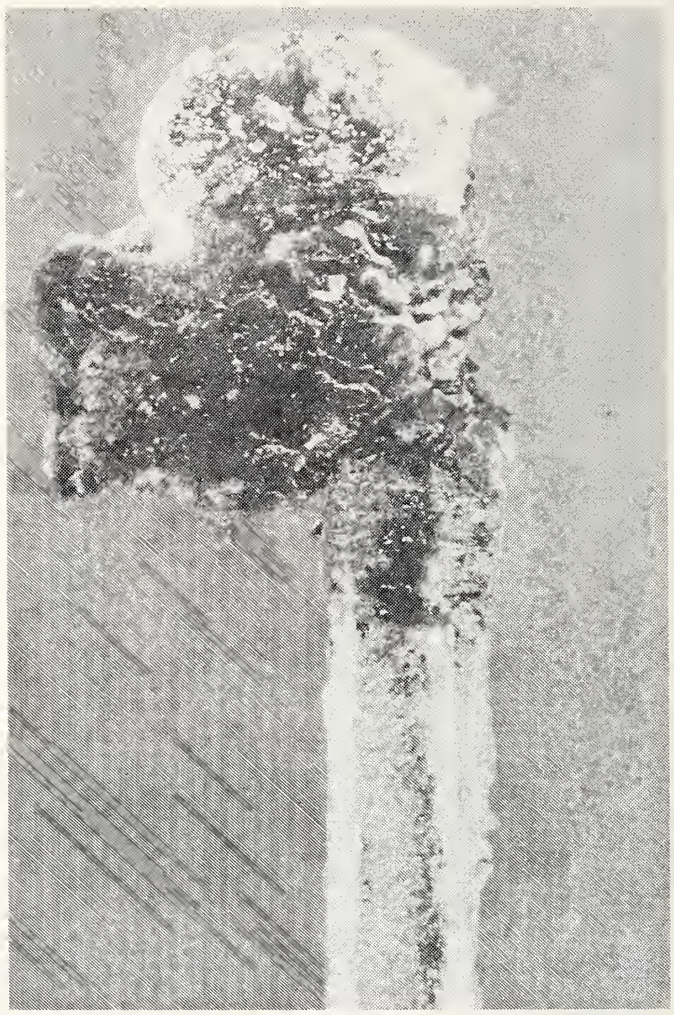


Fig. 2D—(Case 2) Gross pathological specimen demonstrating destruction of the proximal shaft of the humerus, soft tissue extension, and preservation of the articular cartilage.

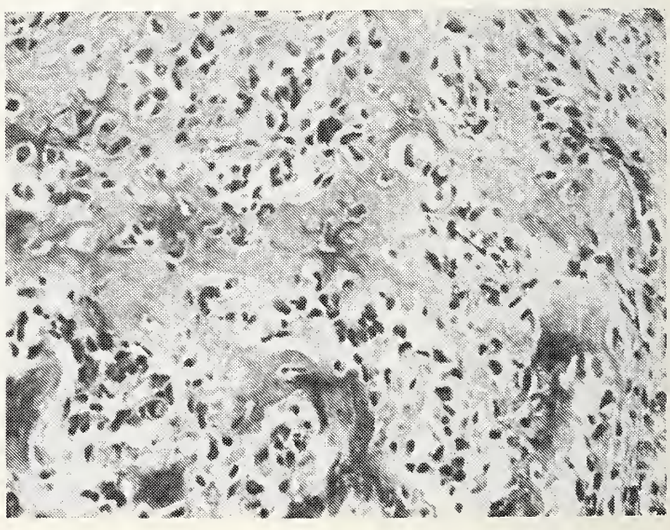


Fig. 2E—(Case 2) Typical osteosarcoma showing areas of anaplastic cells and osteoid production.

pathological diagnosis. However, there is little in the literature to indicate, on a statistical basis, that this method results in fewer long term survivors.

Our own experience is that we have twice as many five year survivors in those we have done frozen sections on but there are so many other variables that it is impossible to say that it is anything more than suggestive.

Along that line, we have found, at least in the lower extremity, particularly lesions about the distal femur and proximal tibia, that the use of a tourniquet is a useless procedure if the design of the tourniquet is to prevent intra-operative embolization of tumor cells. A tourniquet does not prevent intraosseous embolization. In an effort to do this we will try and do careful preoperative angiography and venography to estimate where the most proximal venous drainage of the tumor is. At that level we make an incision and clamp the artery and vein until we have established the diagnosis or established that we cannot make the diagnosis on the basis of the frozen section. Then, if we are going to do a primary amputation, we substitute ligatures for the clamps and complete the amputation. If, on the other hand, we decide to do a local operation, we make an incision in the vein distal to the clamp, discard the blood in the extremity, flush it with arterial blood and replace it with bank blood. Histological examination of the filtered sediment in the discarded venous blood will consistently reveal tumor thrombi.

Concerning the presence and significance of "skip" lesions in osteosarcoma; we found them in ten of forty consecutive osteosarcomas.[4] The ten we found were half transarticular and half intraosseous. The transarticular "skips" are where you have a lesion in the proximal tibia and a second lesion in the distal femur. There is a transarticular venous plexus in humans and I feel that the "skip" metastasis arises from invasion of tumor into a thin walled vessel and subsequent embolization. The tumor thrombi settle out in the larger intraosseous venous lakes or sinusoids where the blood flow is sluggish and they grow. "Skip" lesions within the same bone are most likely due to intraosseous vascular seeding from the primary focus.

Dr. Thompson:

I think it is worthwhile pointing out that preoperative chemotherapy was used in the first case. Some consideration was given in relation to this to doing less than a disarticulation. I think it is clear from the arteriogram (Figure 1E) that this would have been impossible to do and preserve the femoral artery at the same time. This was subsequently verified by dissection of the disarticulated specimen. I would like to ask Dr. Enneking what he feels the present role of chemo and immunotherapy is in the treatment of osteosarcoma.

Dr. Enneking:

Most people are attracted to the idea of adjunctive therapy. It is clear, however, that there is a dose related phenomenon and that the fewer tumor cells the patient has, the more responsive, in general terms, he will be to any kind of adjunctive therapy. As far as I know, no one believes that you can treat a solid tumor non-surgically, with any non-surgical means, and cure the patient. If you are going to remove the tumor surgically, how much should you excise; all of it, ninety-nine percent, ninety-eight percent, etc.? I do not think anyone knows. So philosophically at least, you can say that now that we have adjunctive therapy to manage the micro metastasis we ought to go the whole nine yards in the extremity to get every last tumor cell out and thus do very radical surgery. On the other hand, you can take the other view and say; now that we have adjunctive therapy to manage those cells, we should just kind of peel it out, attempt to save a useful limb, and see what happens. Subjectively and emotionally I belong to the former school.

As far as the present state of immunotherapy is concerned in the management of osteosarcoma: we have done a fair amount in this field[8,9] and I can say that, at present, immunotherapy, in our hands or any one elses for that manner, has not proven to offer any statistical evidence of increasing survival rates.

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(Continued to page 399)

Special Article

Is There A Relation between Cost and Quality of Medical Care and Health?

SEYMOUR HANDLER, M.D.*

Health care cost inflation is a complex phenomenon, not readily compared to the general rate of inflation. Despite medical cost inflation, no significant improvement in either the quality of medical care or the health of the people has occurred. Suggestions are offered to moderate the rate of health care inflation and possibly perform better service for our patients.

THE PRESUMPTION THAT increased spending will improve the quality of medical care and the health of the nation remains unproven and is probably erroneous. Nevertheless, most observers, particularly our medical leaders and politicians,[1] have already accepted a direct relation (Figure 1) between cost and quality. Accordingly, several forms of national health insurance are being considered; at least one of the goals is better health. We physicians must examine the relation, hopefully before it is too late, to see if the cost is unrelated to the quality of medical care and health (Figure 2). By studying the question, we may also find an answer to the more fundamental question facing medicine, "what are we doing?"

The relationship, if any, between the cost and quality of medical care and health may be studied in terms of: (1) the health care crisis, (2) the inflation of health care cost, (3) the quality of health, and (4) possible solutions.

Crisis

The "crisis" in health care, although more apparent to politicians and the news media than the average household, relates to difficulty of *access* and inflation of *costs*. Access problems are being attacked by increased numbers of medical schools and graduates. Despite a growing abundance of physicians,[2] complaints[3] about access to the medical system continue. I believe the complaints are based on faulty premises and are more apparent than real. Difficulty of access[4] to medical care is cited as a major problem to people in the inner city ghettos. Although a convenient focus point, medical care access is a minor inconvenience to these unfortunate people deprived of almost everything. They are plagued with poverty, broken homes, racial discrimination, chemical abuse, crime, ignorance, lack of mobility, cultural deprivation, etc.; medical care access may be the least of their problems. Placing a physician's office or clinic on every street

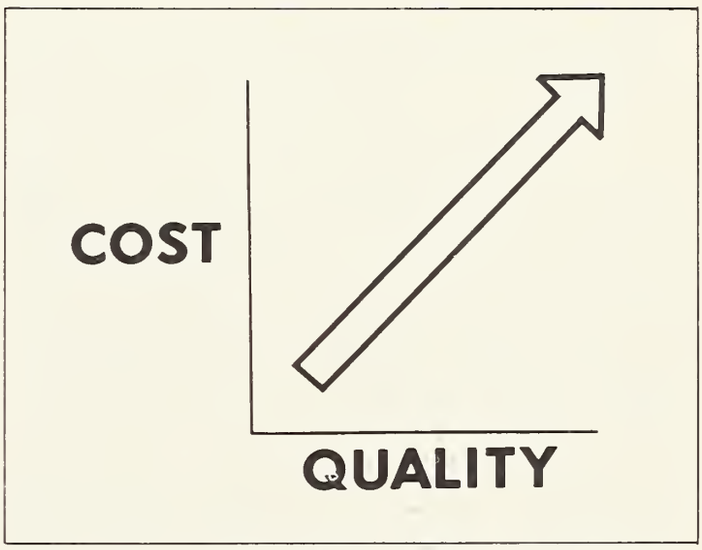


Fig. 1—A direct relation between cost and quality of medical care and health.



Fig. 2—No relation between cost and quality. As costs escalate, quality is unchanged.

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Presented at: Department of Laboratory Medicine and Pathology Grand Rounds, November 10, 1976.

corner in the ghetto will do little to solve their larger problems.

I also question problems of medical care access in rural areas. Should small towns attract physicians any more than attorneys, bankers, college professors, intellectuals, or any one preferring the cultural stimulus of our major cities? Should every town of 800 people have a physician? Would it make a difference to their health and their well being? I don't think so. The small town citizens would be better served by driving 10 miles on a good road to a community of 5,000-10,000 where a group of physicians practice together, offering more varied and continuous care. Is that too far to go? A fifteen minute drive to the next town may be no less of a problem of access to the rural citizen than driving for 30 minutes to the urban doctor's office. Does the distance jeopardize their health? Again, no — rural people usually enjoy better health than their big city counterparts — and without a doctor.

The major component of the health care crisis is cost[5] inflation. Indeed, in the past decade, the rate of increase of costs of health care has exceeded the general rate of inflation by slightly less than twice (Figure 3). Such comparisons are misleading, because implied is that health care is a discrete and unchanging entity. Not so. Whereas the cost of a kilowatt-hour of electricity or a gallon of gasoline can be compared from one period to the next to gauge the rate of inflation, similar comparison of such a heterogenous entity as health care leads to erroneous conclusions.

The system of health care in 1977 is drastically different than in 1965; the component parts of the system require dissection to make meaningful comparisons.

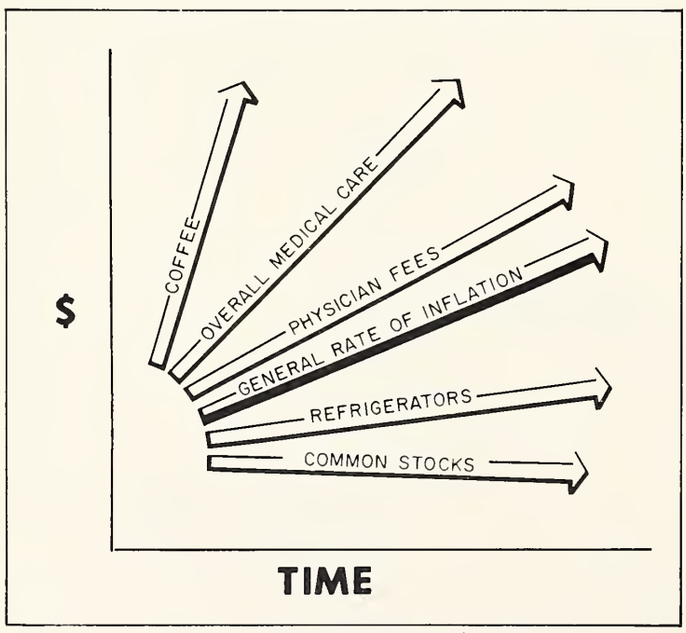


Fig. 3—Comparison rates of inflation.

Inflation of Medical Care Costs

The inflation of health care costs may conveniently be divided into the following parts: (1) hospital factors, (2) physician factors, (3) drugs, (4) third party reimbursement, (5) the role of government, and (6) social changes.

Hospital Cost Inflation

A large part of the inflation in total health care costs is due to hospital cost inflation. Whereas physician fees compare favorably to the general inflation rate, hospital costs have escalated more than 400% since 1950 (Figure 4). Although some of the hospital inflation relates to "medical progress" and is conceivably justified, all factors should be examined for their contribution to see if the expenditures are warranted. The outline to follow is not all inclusive but certainly encompasses the major factors.

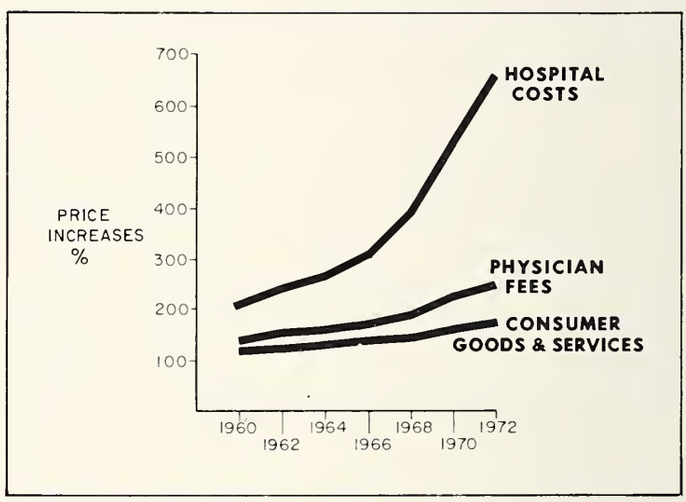


Fig. 4—Comparison of hospital and physician costs with general rate of inflation.

Advances in medical technology have been geometric in the past two decades. Major additions in the hospital include intensive care units (both general and newborn), coronary care units, open heart surgery, prenatal obstetric monitoring, laminar flow surgery, chemotherapy for malignancy, advanced radiologic catheterization and imaging techniques, etc. Most are so well established as everyday techniques that questions of indication and yield are not even asked. Hopefully, major technologic innovations should be evaluated prior to general introduction, not only to justify costs, but also to avoid medical disasters. Consider, if you will, the dissemination of gastric freezing machines for control of peptic ulcers into hundreds of rural communities a decade ago. Consider

abandoned surgical techniques for coronary heart disease — internal mammary artery ligation and implantation, pericardial abrasion — subsequently demonstrated to have little or no value, but only after thousands of operations had been performed. Indeed, major medical technological progress should not be impeded, but careful evaluation in appropriate investigational surroundings should precede widespread introduction of every new gadget or technique.

Labor cost inflation dated from the Social Security Act of 1965 — Medicare in 1966. An appropriate amount of "catching up" occurred. Not only did the involvement of Uncle Sam as a major third party provider enable hospitals to pay underpaid employees a living wage, but the number of hospital workers per patient also increased. As reimbursement formulas made it easy to afford technicians and other personnel, they were hired. We are all aware of the dramatic increases in stipends paid to our interns and residents in the past decade. Whereas in the olden days, we were content to receive fifty dollars a month and upkeep to be interns at a charity hospital, our residents are now paid in five figures per annum. Unfortunately, with all that extra reimbursement, they spend more time contemplating recreational activity than discussing "great cases."

The *White Coat Revolution* in hospitals in the past two decades denotes the transfer of responsibility from the nursing service to a host of new technicians. Much of what formerly was nursing responsibility has been delegated to new or enlarged paramedical disciplines. The new services include inhalation therapy, open heart surgery technology, special cardiovascular procedure technicians, hospital chaplains, social service, occupational therapy, etc. Admittedly, some of the transfer of responsibility from the bedside nurse to a better trained person benefits the patient. Some does not. The only thing certain is that it costs more. In a bygone era, the nurse encouraged the postoperative patient to take a deep breath and cough to prevent atelectasis. Now, a white-coated inhalation therapy technician handles this function with an intermittent positive pressure breathing apparatus. It costs much more and doubt exists that it is any better. In the olden days, the patient's minister visited the hospital to provide spiritual aid at no added cost. Now full-time paid chaplains visit patients, often without invitation, and probably do not perform as well. The availability of social workers in hospitals to provide aid to patients and families is an improvement over the limited capability of the nursing service in disposition problems. Still, not every hospital requires a total social service section providing services that could be performed more efficiently on the county level. Each addition to our White Coat Revolution should be evaluated in terms of benefit to the patient, relating costs to the service provided.

Hospital competition has been frequently debated in the media and legislatures for years without significant correction. Community hospitals remain almost autonomous autocracies, answerable to nobody, and glorifying in growth and expansion of influence. The results of this autonomy, despite certificate of need laws, is duplication of services and equipment, empty beds and great expense. Why has this problem not been solved, despite a decade of hand-wringing and public self-flagellation? The answer relates to lack of understanding of decision making responsibility and the power structure of the community hospital. The proper relationships of power (Figure 5) involves three elements—the Medical Staff, Administration and Board of Trustees—interrelated and each contributing to decision making. The Board of Trustees should provide the broader interest of the community, avoiding questions of hospital loyalty or power. The Medical Staff should provide professional input defining medical needs for their patients. Administration should answer to the other two, providing information of financial feasibility and administering the recommendations of the physicians and the Board. Unfortunately, this division of power rarely exists. All too often, the input of the Board is made at a monthly friendly dinner meeting where Administration tells the Board what is planned and requests a rubber stamp approval. The Medical Staff similarly abdicates its responsibility and provides neither influence nor restraint to Administrative decisions expanding services or purchasing equipment. The Medical Staff is not a cohesive entity despite the term. Rather, the Medical Staff is an impotent collection of practitioners bringing patients to the hospital, functioning independently, and with primary concern for their practice—not the hospital. Until this changes, and change is not on the horizon, physicians will count for nothing in

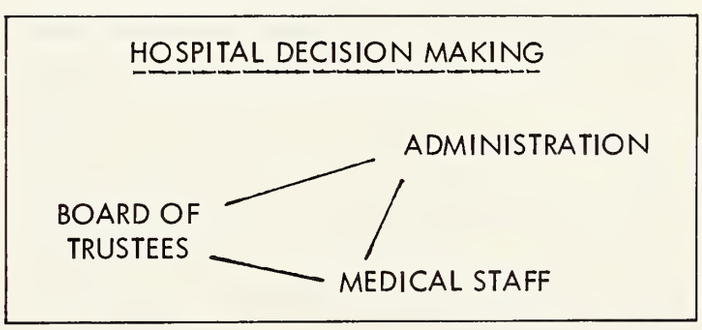


Fig. 5—Relationships in hospital decision-making. The "power structure."

hospital decisions and Administration will retain total responsibility. Although decision making is easier by not involving dozens of bickering independent practitioners, each with a strong opinion, the decisions of Administration are often not made in terms of benefit to either the patient or the community.

Conversion of Hospital to Medical Center—In an earlier time, the sole purpose of the hospital was to provide a facility where physicians could care for their patients for conditions not amenable to home or office management. Some physicians and most patients still consider the hospital role in that light; unfortunately, such is not the case. Hospitals, now called medical centers in either name or function, provide a vast array of services and functions unrelated to the basic concept of patient care. Despite the absence of demonstrated need or desire for this proliferating superstructure, it expands and the patient pays for it. Hospitals provide community "outreach", involving themselves in social or paramedical activities unrelated to inpatient care. The hospital provides meeting rooms and support for innumerable community activities, which, despite possible intrinsic value, should not be a cost to an inpatient. Hospitals have large security departments with elaborate television surveillance equipment. How much security is really required by a hospital to safeguard patients against real or imaginary hostile elements? Would not adequate security be provided by a few Pinkerton detectives and by maintanance and housekeeping personnel, appropriately deputized and trained? Each hospital now has a public relations department. How does the image of the institution relate to patient care? Why does each hospital provide a home care nursing service? Would not this function be more efficient as a community-wide or county responsibility? These difficult and possibly unpleasant questions demand answers. Otherwise, a medical center mentality proliferates, and costs to the patient and community escalate. Physicians should indicate their desire for a hospital to take care of their patients —not a medical center.

Physician Services Cost Inflation

Although physician fee inflation is only slightly higher (Figure 3) than the general inflation rate, the physician's responsibility for guiding the patient through the complex medical care system gives him an influence over health care costs above and beyond his fee. Physician choices decide how much expensive hospital care a patient requires. We will examine factors in medical activity since 1960 with an effect on physician decisions.

Diagnostic and Therapeutic Bandwagon—The inherent optimism, exuberance and action-orientation of the physician leads him to accept and use every diagnostic and therapeutic modality as fast as it becomes available, usually before appropriate evaluation.[6] Not only is this activity expensive, it is frequently unsound medical practice. Consider how many ill-conceived surgical procedures or drugs have been abandoned as useless or harmful. The current surgical bandwagon is coronary bypass surgery. Do the cardiologists and cardiac surgeons really think they will correct or improve a complicated metabolic disorder and product of our affluent Western civilization with a scalpel? Diagnostically, cardiologists pass catheters and bounce sounds off structures at a geometrically increasing pace. Radiology departments[7] purchase every new piece of imaging equipment as soon as available, obsoleting last year's apparatus. Obviously, some of these changes have merit, but a much greater yield would occur to the patient if each new technique or machine would be thoroughly evaluated before introduction to every community hospital.

Malpractice Insurance—More than enough has been spoken and written about malpractice insurance, litigation and defensive medicine. I maintain, that if physicians practice good medicine and are oriented towards doing what is best for their patients, very few successful malpractice actions would occur. We should not let the courts or attorneys or medical-legal fear influence significantly the practice of medicine. Practice medicine as best you can—not law.

Unnecessary Surgery—The question of unnecessary surgery generates a morass of debate, confused by anecdotes and the impossible definition of "necessary." Despite more heat than light, most careful studies[8,9] indicate that our fee-for-service system of surgery contributes to more, rather than less, surgery. The convincing argument is that if the surgeon receives a fee if he operates, and gets a lesser or no fee if he does not, and since most surgeons have both the temperament and time to perform surgery, then any reasonable opportunity will result in an operation. Contributing to this is the patient's willingness to have an operation— a constant source of amazement to me, the public's adoration of the surgeon or other *do*ing doctor, and the generous fee schedules in surgery. All factors considered, it would be quite surprising if the efforts of surgeons would tend to minimize surgery. The Blue Cross Study[8] in Kansas and Glover[9] in England conclude that the amount of surgery performed is directly related to the availability of surgeons and hospital beds. The medical variation of Parkinson's

law states "patient admissions for surgery expand to fill beds, operating suites, and surgeon's time." Unfortunately, these conclusions imply greed and lack of concern for the patient's welfare. A more accurate conclusion is that the amount of surgery done is a reflection of subconscious but normal behavior.

Subspecialization, particularly in internal medicine, is a fascinating study of the economic education of physicians. Many internists, particularly those recently in fellowship training, recognize that internal medicine is increasingly considered part of primary care. Therefore, the only way to be distinguished from a family practitioner is to obtain subspecialty training and certification. To a significant extent, the subspecialties most attractive to general internists are those with a gimmick. Surgery fee schedules teach an object lesson. If you perform a procedure, you command a handsome fee. Gastroenterologists performing gastroscopy charge a fee similar to that for appendectomy. Cardiologists performing coronary arteriography have a fee schedule competitive with a urologist doing a transurethral prostatic resection or the orthopedist performing a laminectomy. Swan-Ganz catheter placements are the most recent innovation in competing with surgical fees. In a previous day, the old fashioned internist could spend an hour on a history and physical examination and barely cover office overhead. Or, he could follow a patient with myocardial infarction for three weeks in the hospital—including emergency visits, many telephone calls and visits with relatives—and not receive as much as a surgeon removing an appendix in 30 minutes. The internists have finally learned something from the surgeon (after years of teaching the surgeons): if you perform a procedure or have a gimmick, you will command a handsome fee. The review by Petersdorf[10] places cardiology training in an interesting perspective. He is concerned that the training of 1,000 cardiologists each year may have unpleasant consequences. Since at least half of the time of a cardiology fellowship is consumed by laboratory diagnostic techniques—particularly cardiac catheterization and coronary arteriography—and because remuneration for such diagnostic work is so generous, the real concern is that the procedures will be performed far in excess of needs. The concerns of Petersdorf are attested to by our experience.

Subspecialization problems are not necessarily limited to internists; surgeons also have learned the value of subspecialty training. Traumatic lacerations of the skin, formerly adequately repaired by general practitioners or general surgeons for a moderate fee commensurate with the professional time involved, now are handled by plastic surgeons using fee schedules several times as generous. Admittedly, the plastic surgeon's repair may be cosmetically superior, but how good is good, and who is *that* concerned about a scar on a farmer's back. An interesting development in recent years, responsible for an increase in medical costs, is the inheritance by orthopedists of most emergency room trauma on nights and weekends. Somehow, minor trauma, adequately and willingly handled by family practitioners during daytime or regular office hours, require specialist care at inconvenient hours—at increased cost, of course.

Referral patterns can make a significant difference in cost of care, in addition to quantity and quality of care. For example, if the primary physician seeks internal medicine consultation for his female patients with diffusely enlarged thyroid glands, the internist usually does some straight-forward evaluation of thyroid function and recommends thyroid hormone suppression of the inflamed gland. If, on the other hand, the primary physician's wont is to send the patient to his surgical consultant, the approach is more likely to include surgical removal of much of the offending gland. Somehow, the patients seen by the surgeon frequently have "intolerable" local pressure symptoms, whereas cases referred to the internist rarely mention local complaints.

Gynecological referral patterns provide amusement to some observers. It is a constant source of amazement to us to see how certain gynecologists are capable of eliciting a history of incapacitating stress incontinence, when the referring physician had not had that complaint mentioned to him at all. It has been facetiously noted that some hit-and-giggle lady tennis foursomes lose as much water in one rush to the net as the patient with "incapacitating" stress incontinence may lose all year.

Also mentioned as an example of specialist abuse is the urological consultation. Almost before the ink is dry on the referral request, cystoscopy with retrograde pyelograms have heen done. Although such devotion to efficient service would ordinarily be applauded, it may be in the patient's best interest to involve the primary physician in the decision to proceed with the diagnostic procedure. Can't the urologist offer an opinion without doing cystoscopy—once in a while? Further, how often are retrograde studies of any value when a normal excretory urogram is already available? It has been suggested that the indications for cystoscopy, with and without retrograde studies, should be more clearly defined. Unfortunately, such

definition is slow in coming, or voiced very quietly, because those best equipped to speak out are also those benefiting most by maintenance of the status quo.

Changes in medical style are difficult to describe objectively, but the two changes significant to me are the demise of the house call and the increasing use of the emergency room for after hours medical care. The abolition of the house call should be applauded. The house call was uneconomic and ineffective, except under most unusual circumstances. The ascent of the emergency room in primary medical care may not be an equally useful change. Emergency room care is notoriously expensive, inefficient and lacking in physician-patient rapport. Physicians serving in ERs are often working part-time in fellowship training and lack the necessary experience in everyday primary care problems to separate minor, self-limited conditions from abdominal catastrophies or an Addisonian crisis. Too often, the minor stomach ache is evaluated with complex and expensive laboratory or radiologic aides, when a wiser and more experienced clinician (preferably the patient's own physician) would recognize the true nature of the ailment and prescribe simple remedies. The lack of prior patient rapport and the inordinate fear of litigation contribute to added costs in the emergency room. If the attending physician could maintain control of his patient's progress in the emergency room, some of the unnecessary diagnostic and therapeutic measures would be avoided. Such control would depend on the patient calling his/her physician first, prior to visiting the ER. In many cases, temporizing or simple suggestions would obviate the ER visit entirely. If, however, the patient is in the ER prior to communicating with the attending physician, the patient would still be better served if the physician is consulted on the phone before elaborate tests are ordered. If our physicians continue to permit the emergency room to care for their patients in after-hour situations, the quality of medical care will suffer and costs will continue to escalate.

Confusion of the Physician's Role—A recently emphasized contribution to health care inflation, involving the physician, is our apparent lack of realization that death is a part of life. The time will come when we must die, and it is equally as immoral to needlessly prolong the process of dying as it is to shorten life. Physicians must balance their guilt, science and professional disappointment with compassion and humanity. Permit patients to die if the time has come. Do not involve the courts and attorneys in the medical decision of life and death. It is subhuman to maintain a dead body on a life-support machine days after death has occurred.

Drug Factors in Cost Inflation

Although drug costs comprise only 10 per cent of the cost of health care and inflation in drug prices are comparable to the general inflation rate, factors in drug prescribing are worthy of consideration, both to reduce costs and to improve medical care. The portion of the retail ethical drug dollar allocated for research and development is quoted[11] as 6%. Four times as much-24%- is spent for promotion, an interesting euphemism for advertising. The drug industry has traditionally argued that high drug prices are necessary to offset the high risk involved in the development of new drugs. Despite the alleged high risk, no major drug company has been close to going out of business in the past 25 years. Also, although the drug industry claims its profits are modest, the stock market disputes that contention; drug companies have been given consistently high price-earning ratios for several decades.

Is the 25 per cent promotion expenditure justified? The industry[12,13] argues that drug advertising provides important information to busy doctors, information that is factual and educational. Accordingly, 20,000 professional representatives (otherwise known as detail men) were supported in the field in 1971 at a company cost of $35,000 each—a total of almost 1 billion dollars then, and admittedly 1.3 billion now[11]. The industry spends $4,000 per year per practicing physician to persuade doctors to prescribe their products. Is this indeed education?[13] More important, is it of any value to the patient, who ultimately pays the expense of the detail men? A reasonable definition of the education process requires that the learner examine all aspects of a question, weigh the evidence, and draw an objective conclusion. Clearly, the detail man is not paid to participate in such a process. He will not provide all the information; he may even exaggerate or deemphasize pertinent factors. A salesman cannot be an educator, and without any doubt, the detail man is hired to sell. Nevertheless, frightening estimates[12] indicate that between ½ and ¾ of drug prescribing decisions are made on the basis of information given to physicians by the detail men. This situation is disgraceful and an insult to the intelligence of the medical profession. Worse yet, it is a disservice to the patient who employs a physician to prescribe on the basis of facts, not propaganda.

Third-party Insurance Factors

The effect of third-party insurance as a participating

factor in health care cost inflation has been extensively debated. Reimbursement formulas[12], whether federal through Medicare or private through the Blues or others, provide little incentive to contain costs. Actually, the excessively complete coverage provided for hospitalization in contrast to out-patient care contributes to high utilization of the cost-intensive hospital.

Without discussing all the complex fiscal factors inherent in third-party insurance coverage, one might understand the inflation-stimulating potential of medical insurance on simple business principles. In the olden days, fee arrangements were on a face-to-face basis between provider and consumer, the physician and his patient. This direct line of communication inherently limits fee schedules, because the personal nature of the transaction tends to limit charges. The charges are clear to both the physician and his patient, avoiding the current practice of skillful and elaborate itemization to make simple medical care appear complex and therefore more expensive than necessary. With the advent of almost universal third-party insurance, the efficient and personal fee system has been eliminated. The providers of services, the physician or the hospital, now charge whatever the third party allows, typically formulas on the high side to minimize bickering and dissatisfaction. The consumer of services, the patient, has little concern about the level of charges because the insurance premium has already been paid and the patient has no additional out-of-pocket expense. The third-party intermediary has little concern about the magnitude of the charges. After all, the third-party bureaucracy is really only a clerk or a computer, and a big number is no more work to process than a small one. The third-party system becomes inflation-promoting on simple business grounds.

Government Factors in Health Care Inflation

The role of government in promoting health care inflation is both obvious and paradoxical. Federal expenditures for health rose from 3 billion dollars in 1950 to 40 billion in 1974. Government expenditures now account for 40% of all spending on health. When the government provides money, it will be spent. Not only will it be spent, but it will be used inefficiently and with little incentive for economy. Further, as the recent Medicaid scandals demonstrate, the plentiful pot of gold is ample temptation for the unscrupulous, realizing that the government is easy prey for the thief. Government spending on health includes direct aid such as Medicare, research, aid to education, medical facility construction, etc. The above are generally acceptable; expenditures on PSRO, HMOs, and other innovations are of less convincing value. Despite the role of government in contributing to health care inflation, the government paradoxically is the loudest complainer, insisting on economy despite its contribution to waste.

Social Revolution Cost Factors

The revolution in social attitudes contributes to health cost inflation. The age of contraception, sterilization and abortion has transferred costs from the individual to health care. Voluntary sterilization and the increase in gynecologic surgery point to social attitude changes rather than medical indication as factors in cost inflation.

We have now explained the several factors involved in health care inflation. Is this increase in expenditures accompanied by improvement in medical care and the health of the people (Figure 1)? Or, has the inflation in health care costs resulted in no change in the quality of care and health (Figure 2)? Again, our political and government leaders have accepted the conclusion that spending more money will improve health. Is this assumption accurate? Obviously no, and the following will support this conclusion.

Quality of Health

Mortality statistics provide the most objective data on the health of our people. A legitimate objection to the use of mortality statistics to gauge health is that most conditions treated by physicians in everyday practice do not show up in mortality tables. True, but the illnesses that *do* cause mortality are the disorders treated in hospitals, and hospitals contribute more to health care inflation than out-patient care where the less significant and non-lethal illnesses are seen. A distinction between "caring" and "curing" may also explain the use of mortality data in assaying the health of the nation. "Caring" is what physicians do for patients in their offices, treating illnesses which are often self-limited or more discomfort-producing than of danger to life. "Caring" is indeed an important part of medical practice, providing relief to painful or anxiety-producing illnesses. These lesser illnesses are treatable with simple measures or no treatment at all, and office-type illnesses are not the diseases involved in the health care inflation of the past two decades. If physicians make "caring" expensive, such as with the excessive practice of health screening of well people, then cost inflation will spread from the hospital to the out-patient facility.

Mortality trends since the beginning of the century provide insight into the accomplishments of medical

science. The excellent review by Peery[15], utilizing official statistics[16] reveals major improvement in the overall death rate from all causes from 1900 through 1950 (Figure 6). From 1950 on, the period of greatest inflation in health care costs, the overall death rate remains about the same. The improvement in mortality from infectious diseases (Figure 7) has been lost because of the dramatic increase in mortality from degenerative disease over the past 50 years.

Credit for improvement in the care of infectious diseases with decreased mortality has been given to antibiotic agents. The major improvement in mortality from infectious disease (Figure 7) occurred long before the advent of antibacterial drugs. Economic factors and advances in public health accounted for the major changes—not medical care.

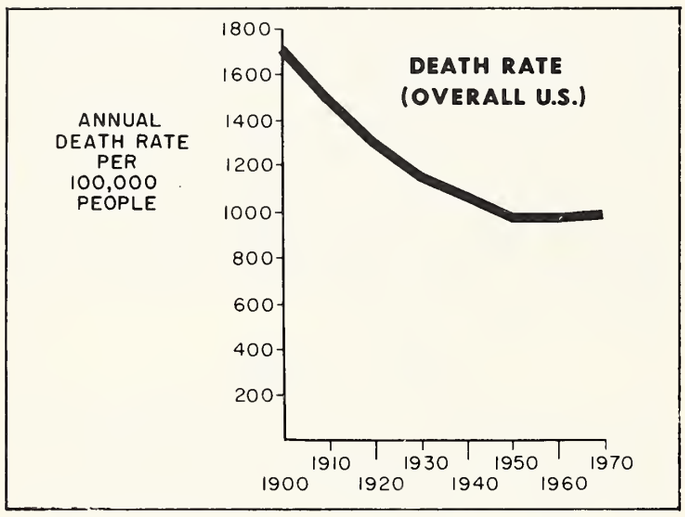


Fig. 6—Overall annual death rate since 1900.

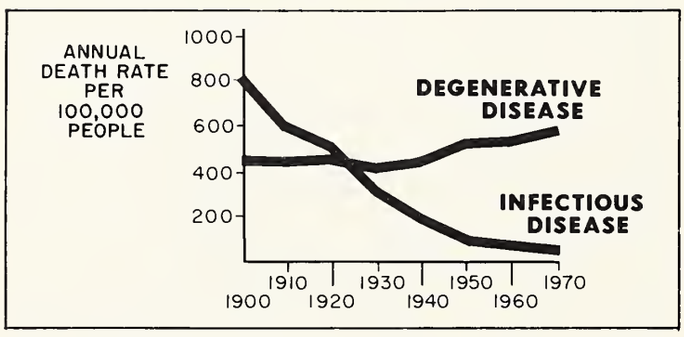


Fig. 7—Changing proportions of infectious and degenerative disease mortality.

The corresponding increase in mortality from degenerative disease, mostly cardiovascular or cerebrovascular disorders, has created an epidemic for the past three or four decades. Medical care has been notoriously ineffective in improving mortality from vascular disease, despite coronary care units, bypass surgery, coronary arteriography, and other major "improvements" of the past 10-15 years. The epidemic of coronary heart disease, which now accounts for one-third of all deaths in the United States, will not be changed until our life style changes. Anything[17,18] done to convince people to stop smoking cigarettes, to reduce dietary intake of saturated fats, to participate in active sports rather than watch others play, will do a great deal more for the health of our coronary arteries than any fancy procedure or operation currently in vogue. When will physicians accept the obvious conclusion that the American style of living is lethal to our middle-aged male and that medical care offers little to change that?

Neoplastic diseases continue to be a significant factor in mortality[19]. Despite all kinds of public education, elaborate health screening, annual proctoscopic exams, chemotherapy, tumors continue to account for over 20% of deaths. Evidence continues to accumulate that our life style and environmental factors[20] play a large role in causing cancer. Little doubt exists that cigarette smoking causes most cases of bronchogenic carcinoma and that our low fiber and high fat diets contribute to cancer of the large intestine[21]. Measures to reduce the incidence of these malignancies are obvious; unfortunately, instead of teaching good health practices, our emphasis has been promotion of the annual physician exam.

After emphasizing that modern medical care has done little to influence mortality trends, how does life style and social factors account for mortality? Data (Table 1) on the causes of death in young, middle aged and elderly white males is enlightening. Although very few (only 1090/100,000) white males die in the decade of life from 15 through 24, almost 4/5 of those deaths

TABLE 1
Deaths (And Per Cent of Total)/100,000 White Males In Decade of Age

Cause of Death	15-24	35-44	55-64
Trauma	1117 (67)	672 (19)	856 (4)
Homicide and Suicide	188 (11)	330 (9)	410 (2)
Neoplasms	103 (6)	507 (15)	4697 (21)
Heart Disease	28 (2)	999 (29)	9940 (45)
All Causes	1090 (100)	3458 (100)	21902 (100)

are related to accidents, homicide and suicide. This data is even more striking for black Americans. Even in the decade of life in the productive years, age 35 through 44, trauma accounts for almost 30% of all deaths. In this middle decade of life, cardiovascular disease is already significant; 30 percent of deaths are related to the coronary epidemic. In the elderly middle years, age 55 through 64, when 1/5 of white males will die, cardiovascular and cerebral vascular disease account for about ½ of total deaths. About one-third of the deaths due to neoplasms are lung cancer. If the premise is accepted that bronchogenic cancer and most cardiovascular disease is related to the American life style, one wonders what role the individual physician plays in altering these frightening statistics. I believe the role is almost nil.

An interesting study[22] of the effect of life style on mortality statistics compares Nevada and Utah. To most outward appearances, the two states are similar —size, climate, population, per capita income, number of physicians and hospitals per population, etc. Despite the similarities, death rates in any decade of life, male or female, are much higher in Nevada than in Utah. Life style accounts for the mortality differences. Mormons in Utah do not smoke or drink and live quiet, stable lives with little divorce or mobility. Nevada has high alcohol and cigarette consumption, a high divorce rate, and much mobility. When the data (Table 2) is examined with particular emphasis to cirrhosis of the liver and bronchogenic cancer as causes of mortality, the state differences are even more impressive. In several decades of life, Nevada exceeds Utah in death rate by several hundreds percent.

TABLE 2
Excess of Death Rates in Nevada Over Utah for Liver Cirrhosis and Lung Cancer

Age	Males	Females
30 - 39	590%	443%
40 - 49	111	296
50 - 59	206	205
60 - 69	117	227

The Answer

Our original question has been answered. Clearly, there is no relationship (Figure 2) between the cost and quality of health care and the health of the people[23,24]. Each additional cost factor, whether hospital or physician induced, will result in no improvement in quality, only an obvious increase in cost. These truths must be made clear to our medical leaders and politicians before new and expensive ventures in government control of health are introduced. If we are not going to make health care any better with additional expenditures, why spend more money doing it? We should accept the great wisdom expressed by Rene´ Dubos[25], that only major changes in the American style of living will have significant effect on the health of the people.

Possible Solutions

Lest we be guilty of painting too pessimistic a picture, certain remedies are available to physicians which may retard the trend to further escalation of health costs. If we acquiesce to what we consider an inexorable course toward regimentation by forces outside of medicine, not only will our independence be lost, but health care for our patients will suffer. Therefore, the following comprise an incomplete list of suggestions and solutions:

1. Recognize that *more* medical care is not necessarily *better*. Physicians should be more realistic about the results of their own efforts and the *real* accomplishments of medical care during this century. Most of the apparent improvements in health since 1900 have been the results of changing economic factors and improved public health, not the results of *a* physician treating *a* patient.

2. Be realistic about the yield of preventive medicine[24,26,27] on the physician-patient level. Despite governmental and other organizational ballyhoo, the early detection of significant and treatable disease in the asymptomatic patient is a rarity. Routine screening examinations of well people are seldom fruitful. On the contrary, minor conditions, better left undetected, are occasionally found, demanding expensive and uncomfortable investigation and treatment. Physicians should emphasize what they do best —episodic care of symptomatic patients.

3. Organize your practice to a patient orientation rather than convenience to the physician, the hospital or the "system." Far too often, medical activity is generated with little consideration of what is best for the patient. Avoid the philosophy of "this is what we do" or "this is the standard care" or "this is my thing."

4. The primary physician, whatever his title, should assert his role as "captain of the ship." The primary doctor should retain responsibility for guiding the patient through the complex medical maze, suggesting consultation when needed, and the person to whom the patient can turn for answers and direction. The primary physician should prevent the superspecialist from "doing his thing."

5. Physicians should play a dominant role in the operation of the community hospital. If the Board of Trustees abdicates its responsibility to represent the greater community interest, the Medical Staff must accept the role. Physicians must redirect their basic loyalty to the hospital, in addition to their practice.

6. Encourage third-party insurance reform, so that reimbursement formulas cover catastrophic expenses and reintroduce a direct charging relationship between physician and patient.

7. Outlaw the drug detail men.

8. Practice medicine, not law.

Summary and Conclusions

We have attempted to indicate that the inflation in health care costs is a complex phenomenon, composed of several factors, and not amendable to simple comparison with the general rate of inflation. Medical care has made drastic changes in the past 25 years, such that simple comparison of costs is inaccurate. Much of the inflation is in the hospital; direct physician costs are comparable to the general inflation rate. Despite the inflation of health cost, no corresponding improvement in the quality of care or the health of the people has occurred. This great disparity between cost and quality of health care is the great challenge to medicine today. A few timid suggestions are offered to place the contributions of medicine in a clearer light and to possibly slow the rate of health care inflation.

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MINNESOTA MEDICINE

The Board of Editors of MINNESOTA MEDICINE invites the members of the Minnesota Medical Association to submit examples of their art work for publication on the cover of MINNESOTA MEDICINE. Color photographs, preferably transparencies, as well as photographs of paintings, drawings, sculpture, ceramics, jewelry, etc., are all welcome. There is no limit as to subject, but pictures of Minnesota or subjects topical to a month or season may have a slight advantage. Pictures will be returned if identified with the name and address of the maker. Please submit pictures to the Editor of MINNESOTA MEDICINE, 101 East 5th St., Suite 900, St. Paul, Minnnesota 55101.

Minnesota Medical Association

MINNPAC Needs Your Support

JIM SOVA*

The second half of the 70th Minnesota Legislature ended on Good Friday after 10 busy intensive weeks of session and committee hearings. Overall, this so called "short session" I think can be considered a very successful one for the Minnesota Medical Association in that some positive legislation was enacted. Even more importantly, a number of bills which would have impacted extremely unfavorably on the practice of medicine either were defeated or failed to receive hearings.

The MMA Division of Socio Economic Affairs, through its staff, and the Committee on Legislation reviewed at least 150 new bills this session of which we monitored and followed at least forty quite closely. Of these forty we were involved and actively participated either through testimony or personal contact with legislators on at least fifteen measures considered extremely important or significant as far as medicine or public health is concerned. These are all reviewed in the wrap-up issue of the Physician's Legislative Bulletin.

Some of the more important issues and accomplishments of this past session included an extension of the Joint Underwriting Association Act which the Association proposed to provide a mechanism for continued availability of professional liability insurance coverage in the event that a significant sector of the medical profession cannot otherwise obtain malpractice insurance coverage through the commercial carriers. In the area of professional liability, the Legislature enacted as part of a bill which originally related only to product liability, a limitation on the ad damnum clause prohibiting stating in any civil action the dollar amount in excess of $50,000. Another provision in the same law calls for reimbursement of court costs and attorney fees if the court finds a civil action (including one for medical malpractice) was brought in bad faith or was frivolous. These provisions were successfully supported by MMA and with the extension of the JUA we feel that the Legislature has taken some positive steps in this area of concern.

As a result of MMA's cooperative effort with the Minnesota Cancer Society, the bill to legalize laetrile was voted down in subcommittee. As a result, no further hearings were scheduled in either the Senate or the House.

The optometrists failed in their effort to require that certain HMOs and in particular, the Physician's Health Plan of Greater Minneapolis, provide the services of optometrists to enrollees as a mandated benefit. This bill had passed the House last session, but died in committee in the Senate.

In other action, the Association once more opposed the perennial issue of mandating a state-wide program requiring school nurses in all school districts to screen for streptococcus infections. The Senate Health, Welfare and Corrections Committee responded to our concerns about cost effectiveness and the practicalities of such a program for all school districts throughout the state, then rejected the bill on an unanimous vote.

In a positive vein, the Legislature voted this year to expand the pre-school requirement for immunizations to include: diphtheria, pertussis, polio, and mumps as part of a nationwide program to increase immunization levels. This new law, proposed by the Health Department was supported by your Medical Association.

We testified in support of the $1.3 million appropriation which eventually was passed providing state subsidy to family planning programs throughout the state, and raised concerns about an unsuccessful bill which would have eliminated the requirement that applicants for medical licensure be of good moral character, repealed the restrictions on advertising, and deleted the prohibition on fee splitting.

The major disappointment of the session was the failure of the Legislature to reinstate the motorcycle helmet headgear requirement. One hearing was held in the Senate Transportation Committee during which the bill received extensive support from your MMA Committee on Automotive Injuries. However, many legislators were reluctant to pursue the issue in this short session particularly in view of the strong campaign waged against reinstatement by literally hundreds of motorcyclists who stormed the Capitol during the committee hearings.

The two major accomplishments for MMA were the defeat of the Certificate of Need Amendments and the Chiropractic Scope Bill. The Certificate of Need Bill would have extended this law to physicians' offices and clinic purchases of expensive diagnostic and therapeutic equipment, placing such acquisitions under the regulatory control of the HSAs and the Minnesota Department of Health. Despite strong

*Address given by Jim Sova, Minnesota Medical Association lobbyist before MMC Medical Staff Meeting — April 10, 1978.

support for inclusion of physicians' offices and clinics in the bill by the leadership of both bodies, a concerted effort by your Association staff and key physicians throughout the state resulted in the provision being voted down in both Senate and House committees by decisive votes and again on the floor of the House by a 91 to 37 margin and in the Senate on a vote of 40 to 20.

Equally, if not more significant, was the rejection on the House floor of an intensive and vigorous effort by chiropractors to expand their practice act to permit blood withdrawal and analysis. This bill which cleared the Senate on a 38 to 25 vote and received vigorous support from literally hundreds of chiropractors and their patients, was endorsed by the Governor's office, the AFL/CIO, the Minnesota Senior Federation and the State Office of Consumer Affairs. Despite these seemingly overwhelming odds, MMA was able to persuade the House to vote down the measure on a 56 to 58 margin.

How did we accomplish this? We brought in expert physician testimony during committee hearings. Chuck Wiger* and I personally contacted almost every member of the Senate and House at least once, if not more, on each of these issues. We solicited by letter, mailgram, and phone call grass roots backup support from physician contacts and Auxiliary members throughout the state in those districts where we felt legislators were ambivalent or leaning with our opposition. We asked legislators for their help. We gave them as much information as possible to encourage them to support MMA's position. Virtually everything humanly possible was done to solicit legislative support on both the Certificate of Need and the chiropractic issues.

Many factors played a role in whether or not we received a legislator's support, not the least of which were political as opposed to rational, scientifically based arguments and testimony. This is the point I would like to underscore. Political involvement through an active, viable MINNPAC with the financial wherewithal to assist and impact on legislative and congressional races is a vital element to our success. But it can continue to be only with your membership contributions to the one organization devoted exclusively to strengthening medicine's voice on capitol hill. Medicine simply cannot continue to be effective without a vigorous political action committee such as MINNPAC.

Fifteen-twenty percent of the physicians in this state, as is the case today, cannot be expected to carry the responsibility for political action for all of medicine. The $50.00 MINNPAC asks as a membership contribution are "peanuts" for each of you. Let me say that these "Peanuts" are not only going to be used to just feed the GOP elephants, because the DFLers in this state need "peanuts" too. They will have them from MINNPAC but only with your help. A bipartisan organization, MINNPAC in 1976 contributed almost equally to Republicans and Democrats. This not only is the way we have to play the game — it may be the only game in town.

The MINNPAC Campaign Fund was depleted in 1976, and physicians must in the next two months replenish it. Our friends who supported us on important issues should receive our help. In those areas where we have antagonistic legislators who have not listened to medicine and have voted consistently against us, medicine must find responsible challengers and begin to support them — starting right now!

I hear the statement made time and again when speaking to physician groups: "I only contribute to individual candidates — I like to know where my money is going." This is all well and good except that I know, and you know, that this is not generally true. As a group, physicians are notoriously poor contributors to political causes. If you don't believe me, ask any fund raiser for either of the political parties. They will tell you so. A doctor told me recently about a statewide solicitation of physicians made on behalf of a leading candidate for Governor of Minnesota. He bemoaned the fact that from a mailing to more than 5000 physicians, they had barely more than paid for the cost of the mailing itself. I am constantly attending fund raisers for candidates and political parties, but it is indeed a rare occasion when I see more than a physician or two in attendance. In contrast, however, the chiropractors are always there. I was present at a fund raiser recently for a Representative, who's district probably has more physicians residing there than any legislative district in the state. This legislator has generally voted with medicine on virtually every major issue. I was actually appalled that during the time I was there only three physicians and their wives were in attendance. One of them was the legislator's brother. If a district such as this is not receiving heavy physician support then what's happening in those districts that are doctor poor in at least numbers.

A tally of the physicians residing in legislative districts shows at least 40 with fewer than 10 doctors, some districts with only one or two. A viable, effective MINNPAC can and will help elect candidates

*Assistant Director, Department of Legislation Affairs, Minnesota Medical Association.

in these districts where there are few if any doctors who could support them.

If there ever was a year of opportunity for physicians to effectively involve themselves in the political arena, 1978 has to be the year. Two United States Senate seats up for grabs, eight congressional seats, the Governor's office and all the constitutional officers plus at least forty of the 134 house seats up for re-election are considered swing seats that can go either way.

In 1976 MINNPAC contributed to a record number of state legislative campaigns — 95 state Senate and House races. Much of our success story from this past session can be attributed to MINNPAC involvement in these and earlier campaigns. We must, however, have the support of all of you if we are to continue to be effective on the hill both in St. Paul and Washington.

There are no strings attached to MINNPAC contributions, but I can assure you that after nine years of lobbying I've found MINNPAC's support generally makes a legislator more willing at least to listen to our story. If they will only listen, we can usually sell them.

Despite the alleged anti-business orientation of this state's body politic, the private practice of medicine is generally healthy here.

There are many examples of why Minnesota is an excellent place to practice. Much of this can be attributed to the effectiveness of your county and state organizations in developing excellent liaison with governmental agencies such as DPW, the Department of Health, and the state legislature.

Let's not forget the AMA. Who do you think will represent you in Washington, to say nothing of their other activities, if it is not the American Medical Association? Are you prepared to fly to the nation's Capitol every time a hearing is scheduled before a congressional committee or some other federal agency? Of course not. But the AMA can't continue to do it without your help and your membership support. Your County Medical Society and the Minnesota Medical Association can't do it without your support and your membership. MINNPAC can't do it without your support and membership dollars. And you just cannot do it alone.

If you don't support your county, state, and AMA plus MINNPAC, then please don't complain about governmental infringement of your professional prerogatives. With but few exceptions I hope never to hear a physician say I can't afford the dues, because *you simply can't afford not to belong.*

I've learned from reliable sources that the chiropractors assessed their members close to $1,000.00 each for their legislative effort this session. At times they had as many as four high priced attorneys at the Capitol representing their cause, and they lost. They will be back next session though as will the health planners and other bureaucrats with more schemes to regulate and control the practice of medicine. State hospital rate regulation may be just around the corner, and next may be proposals for physician fee control.

We *can* prevent physician fee regulation. We *can* again thwart efforts to place your office and clinic under Certificate of Need control. But only if you will commit yourself to being a part of the medical team rather than a staff room critic. By that I mean committing yourself financially and personally supporting the AMA, your County Society, MMA, and MINNPAC.

If you have questions about MINNPAC or desire to know who the organization supports or why, don't hesitate to contact your MINNPAC board member or any of us at the MMA office. It's no secret who receives MINNPAC support, for federal and state laws require reporting of each and every contribution. The MINNPAC leadership will be glad to review, discuss, or justify each and every check written on the MINNPAC campaign fund with any physician at any time. The Board of Directors is also anxious to receive your thoughts and recommendations on potential candidates who should be receiving MINNPAC support.

I would like to close with a quotation by Raymond Moley that I think sums up the message I have tried to convey to you. — Moley states, "Politics is not something to avoid or abolish or destroy, it is a condition like the atmosphere we breathe. It is something to live with. To influence if we wish and to control if we can. We *must* master its ways or we shall be mastered by those who do."

Your support for organized medicine and MINNPAC is the means to this end.

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Indications: Although the principal indication for cloxacillin sodium is in the treatment of infections due to penicillinase-producing staphylococci, it may be used to initiate therapy in such patients in whom a staphylococcal infection is suspected. (See Important Note below.)

Bacteriologic studies to determine the causative organisms and their sensitivity to cloxacillin sodium should be performed.

Important Note: When it is judged necessary that treatment be initiated before definitive culture and sensitivity results are known, the choice of cloxacillin sodium should take into consideration the fact that it has been shown to be effective only in the treatment of infections caused by pneumococci, Group A beta-hemolytic streptococci, and penicillin G-resistant and penicillin G-sensitive staphylococci. If the bacteriology report later indicates the infection is due to an organism other than a penicillin G-resistant staphylococcus sensitive to cloxacillin sodium, the physician is advised to continue therapy with a drug other than cloxacillin sodium or any other penicillinase-resistant semi-synthetic penicillin.

Recent studies have reported that the percentage of staphylococcal isolates resistant to penicillin G outside the hospital is increasing, approximating the high percentage of resistant staphylococcal isolates found in the hospital. For this reason, it is recommended that a penicillinase-resistant penicillin be used as initial therapy for any suspected staphylococcal infection until culture and sensitivity results are known.

Cloxacillin sodium is a compound that acts through a mechanism similar to that of methicillin against penicillin G-resistant staphylococci. Strains of staphylococci resistant to methicillin have existed in nature and it is known that the number of these strains reported has been increasing. Such strains of staphylococci have been capable of producing serious disease, in some instances resulting in fatality. Because of this, there is concern that widespread use of the penicillinase-resistant penicillins may result in the appearance of an increasing number of staphylococcal strains which are resistant to these penicillins.

Methicillin-resistant strains are almost always resistant to all other penicillinase-resistant penicillins (cross-resistance with cephalosporin derivatives also occurs frequently). Resistance to any penicillinase-resistant penicillin should be interpreted as evidence of clinical resistance to all, in spite of the fact that minor variations in *in vitro* sensitivity may be encountered when more than one penicillinase-resistant penicillin is tested against the same strain of staphylococcus.

Contraindications: A history of a previous hypersensitivity reaction to any of the penicillins is a contraindication.

Warning: Serious and occasionally fatal hypersensitivity (anaphylactoid) reactions have been reported in patients on penicillin therapy. Although anaphylaxis is more frequent following parenteral therapy it has occurred in patients on oral penicillins. These reactions are more apt to occur in individuals with a history of sensitivity to multiple allergens.

There have been well documented reports of individuals with a history of penicillin hypersensitivity reactions who have experienced severe hypersensitivity reactions when treated with a cephalosporin. Before therapy with a penicillin, careful inquiry should be made concerning previous hypersensitivity reactions to penicillins, cephalosporins, and other allergens. If an allergic reaction occurs, the drug should be discontinued and the patient treated with the usual agents, e.g., pressor amines, antihistamines, and corticosteroids.

Safety for use in pregnancy has not been established.

Precautions: The possibility of the occurrence of superinfections with mycotic organisms or other pathogens should be kept in mind when using this compound, as with other antibiotics. If superinfection occurs during therapy, appropriate measures should be taken.

As with any potent drug, periodic assessment of organ system function, including renal, hepatic, and hematopoietic, should be made during long-term therapy.

Adverse Reactions: Gastrointestinal disturbances, such as nausea, epigastric discomfort, flatulence, and loose stools, have been noted by some patients. Mildly elevated SGOT levels (less than 100 units) have been reported in a few patients for whom pretherapeutic determinations were not made. Skin rashes and allergic symptoms, including wheezing and sneezing, have occasionally been encountered. Eosinophilia, with or without overt allergic manifestations, has been noted in some patients during therapy.

Usual Dosage: Adults: 250 mg. q.6h.

Children: 50 mg./Kg./day in equally divided doses q.6h. Children weighing more than 20 Kg. should be given the adult dose. Administer on empty stomach for maximum absorption.

N.B.: INFECTIONS CAUSED BY GROUP A BETA-HEMOLYTIC STREPTOCOCCI SHOULD BE TREATED FOR AT LEAST 10 DAYS TO HELP PREVENT THE OCCURRENCE OF ACUTE RHEUMATIC FEVER OR ACUTE GLOMERULONEPHRITIS.

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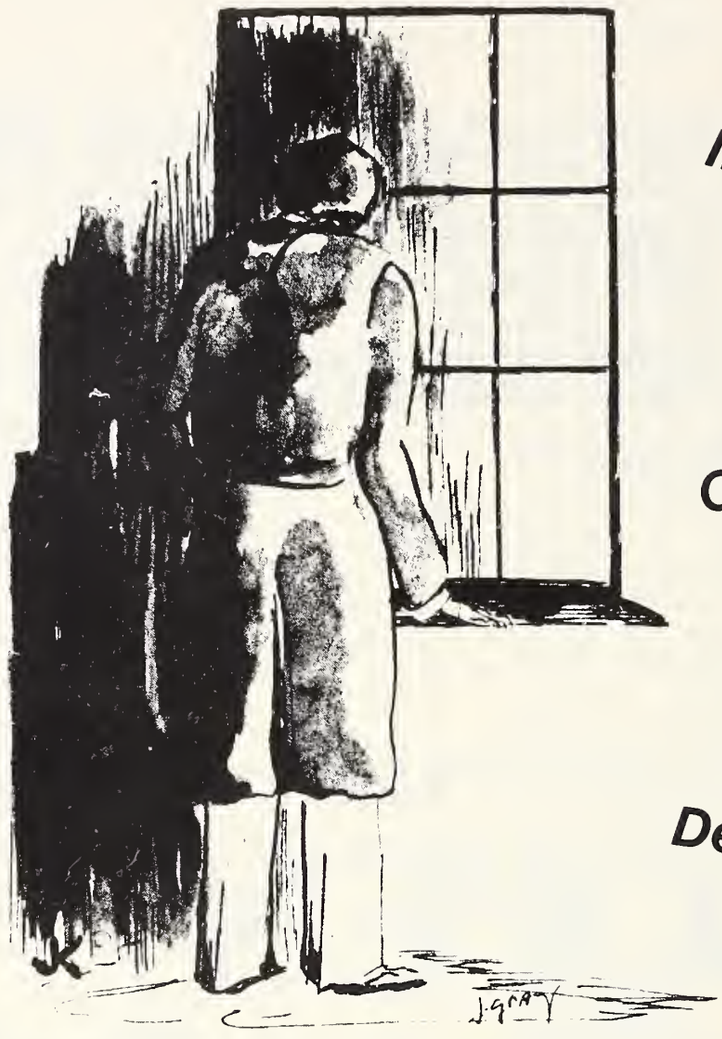
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Please see brief summary for prescribing information.

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(Continued from page 382)

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FOR SALE: Burdick CS 515 Monitor, with stand, excellent condition. Perfect for Doctor's office, exercise testing, or Hospital OR use. Contact: R. L. Thienes, M.D.; Box 1161, St. Cloud, Minnesota, 56301.

Book Reviews

CURRENT MEDICAL DIAGNOSIS AND TREATMENT by Marcus A. Krupp and Milton J. Chatton. Lange Medical Publications, 1976. 1062 pages. $14.00.

This is the 13th annual revision since 1962, and is also available in Spanish, Italian Serbo-Croation, Portuguese, German and Japanese.

Any book that combines current medical diagnosis and treatment into 1000 pages has to deal sparingly with the details. Compression is helped by small type, light weight paper, crowded pages and a soft cover but I found the result annoying to use.

The book also has a failing common to all books of this genre in that each subject starts with a diagnosis. Our problems as physicians start with an abnormal lab result, symptom or physical finding. Starting with a diagnosis begs the questions that I have to ask. Once the diagnosis is established, then the treatment can be cookbooked. Inaccurate diagnosis is what causes the most serious medical and surgical problems for this results in proper treatment for the wrong disease.

Books like this also tend to be a good deal for the author. With the year stamped on the cover you are subtly coerced into buying a new addition at regular intervals lest your bookshelf appears old fashioned. For example, I still have my old Gynecology Text from Medical School but I have bought four additions of Current Therapy by Conn—which brings me to my recommendations:

Current Therapy by Howard F. Conn, M.D. 28th annual edition, 1976. W. B. Saunders and Company. 916 pages. $23.00. Hard cover, heavier paper, larger type, more readable composition. And Current Diagnosis by Howard F. Conn, M.D. and Rex B. Conn, Jr., M.D. 4th annual semi-annual edition. 1974. W. B. Saunders and Company. 1151 pages. $30.00. Same summary as for Current Therapy.

You get what you pay for, and sometimes you can judge a book by its cover.

John E. Smith, M.D.
Minneapolis, Minnesota

PHYSICIAN'S HANDBOOK, 18th Edition by Krupp, Sweet, Jawetz, Bigleiri and Roe, Lane Medical Publications, Los Angeles, California 1976.

This paperback handbook has 719 pages and brings together a wealth of information in medicine, surgery, pathologic physiology, and laboratory procedures. This eighteenth edition has been brought up-to-date. One might quibble why there is a fine chapter on the fundamentals of the electrocardiogram but nothing on hyperalimentation, a long list on normal weights of organs (in case an autopsy is called for, I suppose), but nothing on diagnostic paracentesis in accident cases; or that there is an elaborate picture of how to fasten a straight catheter to the penis, but not how to sink a catheter into the subclavian vein.

This book is a useful guide for the student and the physician, provided it covers what they are looking for.

H. W. Heupel, M.D.
Minneapolis, Minnesota

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Indications: Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

"Possibly" effective: as adjunctive therapy in the treatment of peptic ulcer and in the treatment of the irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis.

Final classification of the less-than-effective indications requires further investigation.

Contraindications: Glaucoma; prostatic hypertrophy, benign bladder neck obstruction; hypersensitivity to chlordiazepoxide HCl and/or clidinium Br.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants, and against hazardous occupations requiring complete mental alertness (*e.g.*, operating machinery, driving). Physical and psychological dependence rarely reported on recommended doses, but use caution in administering Librium® (chlordiazepoxide HCl) to known addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions) reported following discontinuation of the drug.

***Usage in Pregnancy:* Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy. Advise patients to discuss therapy if they intend to or do become pregnant.**

As with all anticholinergics, inhibition of lactation may occur.

Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude ataxia, oversedation, confusion (no more than 2 capsules/day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider pharmacology of agents, particularly potentiating drugs such as MAO inhibitors, phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions reported in psychiatric patients. Employ usual precautions in treating anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship not established.

Adverse Reactions: No side effects or manifestations not seen with either compound alone reported with Librax. When chlordiazepoxide HCl is used alone, drowsiness, ataxia, confusion may occur, especially in elderly and debilitated; avoidable in most cases by proper dosage adjustment, but also occasionally observed at lower dosage ranges. Syncope reported in a few instances. Also encountered: isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent, generally controlled with dosage reduction; changes in EEG patterns may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice, hepatic dysfunction reported occasionally with chlordiazepoxide HCl, making periodic blood counts and liver function tests advisable during protracted therapy. Adverse effects reported with Librax typical of anticholinergic agents, *i.e.*, dryness of mouth, blurring of vision, urinary hesitancy, constipation. Constipation has occurred most often when Librax therapy is combined with other spasmolytics and/or low residue diets.

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All manuscripts will be edited and stylized to conform to the format used in MINNESOTA MEDICINE.

Readers and Reviewers: The right is reserved to reject material submitted for reading or advertising columns. The views expressed in this journal do not necessarily represent those of the Minnesota Medical Association nor any of its constituents.

Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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President's Letter

Love for Our Fellow Man

One of the experiences of my life which has influenced me most and has given me more insight into seeing ourselves as others see us was the close association with a young patient who suffered from what turned out to be an incurable illness. Many of the following observations are based upon sharing the perceptions he had of the system and persons who were trying very hard to help him. Both the system and the individuals in it performed very well, but like any human effort, left room for some improvements. It is toward improvement that these comments come from one who believes very deeply in the basic good of the existing medical care system.

Patients and their families, when faced with serious threats to loss of health, or life, share the common denominator of anxiety, fear, and frustration. Numerators vary widely and may range from dependency or depression to aggressive demanding and even hostility. All expressions of such anxieties, whether based on real or imagined situations, must be interpreted as cries for help rather than criticisms of the people who are trying their best to help. Medical care personnel must retain their understanding, maturity, and equanimity to remain supportive rather than defensive.

Modern hospitals are large and complex institutions. Many routine and standard procedures have been developed to insure at least a minimal level of performance by the individuals who make up the institutions, because these individuals comprise a wide variety of personalities, training, and abilities. When, however, the patient gets the sense of being an object caught in a routine which seems designed to satisfy a compulsion of the system rather than being beneficiary of a system designed and customized for his specific needs, he begins to see the system as depersonalized and from this perception arises the assumption that the system and its personnel are self-serving. Explanations help, but routines must be so designed that their advantages are self-evident to anyone.

Attitudes today which seem dedicated to informality and non-conformity with images associated with functions may be appropriate in some instances, but attempts at personalization by going on a first name basis, for example, may approach anonymity and therefore, be responsible for creating the impression that the individual is merely part of the system and not a responsible, specifically identifiable person. Stimulated by the forces in society today, many institutions of healing are possessed by an obsession to disclose information about possible side effects and complications. These efforts are laudatory and necessary. We still, however, have not learned to handle this aspect of our efforts very well. Somehow warnings come off at inappropriate times and in situations which are more conducive to heightening anxiety rather than reassurance as to the benefit risk ratio.

The patient's perception of his physician is an amalgam of his previous conception of what his physician should be and his inter-reaction between the human being who plays that role at any given time. Physicians are an amalgam of their physical and mental makeup, their past experiences and training, and their perception of the physician role. Physicians should never underestimate his or her importance to the patient particularly in the life and health threatening situation. Since there are as many perceptions on both sides as there are people, no one can fill entirely the role of physician satisfactorily to all people, but certain ingredients may be described, though not defined, as

being essential to practicing the art of medicine. He who would possess the art of medicine must be capable of perceiving the physical, intellectual, and emotional needs of the patient, whether obvious or unspoken, and must be capable of marshalling the appropriate scientific knowledge and skills, and then delivering remedies and advice most conducive to the alleviation of disease in a manner projecting concern and compassion.

Projection of concern alone is also insufficient if the patients get a sense of being treated only by management of the numerical data available on his chart. The patient cries out for the comfort of an intelligent, concerned human guiding his therapy based upon how the patient feels, looks, or presents in the way of physical findings. Every diagnostic or therapeutic event in a patient's struggle with illness must be recognizable to him as a logical progression towards cure or benefit. Physicians who begin a proposal by "There was a study" are immediately suspect, because the patient immediately feels that if he is sprayed with enough tests he will somehow fall into an appropriate pigeonhole. Those, however, who propose on the basis of "I think it likely and therefore propose this examination or therapy" are far more credible since the latter implies that a compassionate expert is logically progressing towards a desired end.

No one wishes to be a neat presentation at ward rounds or even a CPC, but is really interested in receiving the best available therapy at the least expenditure of discomfiture to his being or financial resources. Everyone appreciates understanding and effort, and no one expects the impossible, but merely requires that those to whom he has entrusted his hope for recovery merely apply the most reasonable and accessible possibilities in the most perspicacious way. Contrary to the notion often expressed in social activists literature whose authors frequently call for stripping the doctor of his mystique, patients who have serious problems relate best to a little and sometimes a lot of mystique.

Not only disease is communicable, but so are attitudes, concerns, capabilities, and love. Let us never become so complacent or self-satisfied with scientific accomplishments that we fail to project the unspoken communication of love for our fellow man. For all of us walk on paths on this planet but for a short period of time compared to the history of man and his search for lasting values, for the balance between human pleasures and well-being, and for his own sense of holism.



Robert S. Flom, M.D.
President
Minnesota Medical Association

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Editor's Notebook

Organizing to Contain Health Care Costs: The Minnesota Medical Perspective*

Alfred North Whitehead, a Harvard Professor fifty years ago, observed: "It requires a very unusual mind to undertake the analysis of the obvious."[1] At the risk of being considered "unusual", I shall begin by stating the obvious: Minnesota, where I live, is not New Jersey. The two states differ demographically, geographically, economically, and pathologically, i.e., in diseases citizens die of.

*Adapted from address to New Jersey Medical Society, May 9, 1978, Atlantic City, New Jersey.

Because of the length of this presentation, the Editor's Notebook will not appear in the August 1978 issue.

But we vary little in money we spend for health care. In 1974, Minnesota and New Jersey spent about eight percent more per capita for Medicare patients than the United States as a whole.

As states, then, we share the problem of keeping health costs in line. Today I shall speak of Minnesota's perspective in containing health care costs. First, a few words about Minnesota.

The State That Works

Minnesotans believe in cooperative enterprise between public and private sectors, in organizing to

TABLE 1
Tale of Two States as Told by Basic Data

	New Jersey	Minnesota
Population	7.2 million	3.8 million
Land Area	7800 square miles	84,000 square miles
Population Density	920/square miles	45/square miles
Ethnic makeup	Italian Americans are largest ethnic group; 11 percent of people are black	One of two citizens of German or Scandinavian origin; 1 percent of citizens are black
Climate	Temperate: average temperature, 50° F in winter, 70° in summer	Extreme: average temperature, 10° F in winter, 82° in summer
Economy	1 of 3 in manufacturing	1 of 4 in manufacturing
Relative Death rates/100,000 compared to United States		
All causes	100	86
Malignancies	110	91
Heart Diseases	113	86
Cerebrovascular Disease	87	95
Motor Vehicle Accidents	68	101
Life Expectancy	71 years	73 years

TABLE 2
Money Spent per Medicare Patient. Source: unpublished Data from Social Security Administration

	Per Capita Reimbursement by Medicare (in dollars)	
	All Persons	Persons over 65
United States	$471	$467
New Jersey	508	497
Minnesota	510	498

satisfy the public, and in placing pragmatism above idealogy. What works interests us, not what your politics are. Perhaps this cooperative pragmatism is why liberal Minnesota politicians and conservative professionals and businessmen generally manage to find common ground.

Distinctive Features

Minnesota's ethnic heritage, its geographic isolation, its confidence in its ability to manage its own affairs, and its trust in the political process make it distinctive.

This trust is possible and even justified because Minnesotans are extraordinarily active in local and national politics. Political scientists have long noted how Minnesota citizens crowd local political caucuses and how independent Minnesota voters are. Even political party names, Democratic Farmer Labor and Independent Republicans, reflect this cooperative and independent spirit. Nationally, Minnesota voters routinely lead the nation in percent voting in Presidential elections. Because of political training and activism, Minnesota's political power exceeds the two percent of US population Minnesota people represent.

Three years ago, a *Wall Street Journal* lead article proclaimed Minnesota the "Candidate Factory". For good reason. At the time, four of five candidates for the Presidency were from Minnesota — Humphrey and Mondale for the Democrats, Eugene McCarthy for the Independents, and Gus Hall for the Communists. And, should any of them fail, Harold Stassen was waiting in the wings for the Republicans.

Health, Education, and Commerce

Political activism spills over into the business and medical community. Minnesota business and physician leaders are movers, shakers, and organizers. They have good people to work with. Our citizens have a strong work ethic, a sense of self-responsibility, dedication to health and education, and civic pride.

Permit me to give you a litany of statistics to show this pride has sound basis:

- Minnesota ranks seventh in the country as headquarters for national corporations. In the Twin Cities, many of these corporations, as a voluntary civic duty, give five percent of pre-tax income to cultural institutions.
- Minnesota's highest paid public official is the President of the University of Minnesota, which is the fourth biggest University in the country.
- Minnesota secondary school students have the lowest dropout rate in the United States, and its graduates for seven million citizens, or under two US Armed Forces entry tests.
- Minnesota has three medical schools turning out 316 graduates each year in a state of four million. That's eight graduates for every 100,000 students. Compare this to New Jersey, which turns out 140 graduates for seven million citizens, or under two new graduates per 100,000.
- In the University of Minnesota Medical School — which has the largest organ transplant program in the world, Hennepin County Medical Center — which runs a large teaching program and one of the country's biggest renal dialysis programs, and the Mayo Clinic — one of the finest institutions of its kind, Minnesota has three outstanding medical centers. Because these institutions attract many out of state patients and train many physicians, Minnesota exports doctors and medical care.
- Minnesotans are notably healthy, ranking second in longevity among the other states, third in infant mortality, second in death rates, and eighth in number of deaths from heart disease.[2]

Why the Build-up?

Why have I given you this elaborate build-up about Minnesota before even getting to health care cost containment? Well, this is a sprawling and diverse country. To understand a state's health services you must understand its people. Health services reflect attitudes, culture, and customs of people interacting with the medical profession — which is in itself shaped by the same traditions.

Of Minnesotans' traditions and talents, perhaps the most notable is a gift for organizing public and private forces into workable alliances. Perhaps this gift is a primordial urge to huddle together against the cold. Maybe it's a herd instinct from living on thinly populated prairies. Maybe it's a community tradition from organizing farm cooperatives in a rural state. Or maybe it's because German and Scandinavian blood clumps in our veins.

For whatever reason, Minnesota health professionals are persuaded the best way to preserve the private practice of Medicine is to organize our medical societies, our relations with the rest of society, and our system for delivering care so we can compete in a modern society of interacting pluralistic organizations.

Background Setting

Before I describe what organizational steps we have taken in Minnesota, you may wish to review four social changes that have occurred in the United States since

World War II. These changes, to my mind, make our organizational efforts necessary, relevant, and promising.

1. We have become a society of organizations — a society that entrusts every major social task (education, defense, production and distribution of goods, government services, and health care) to large organizations. Managers — "executives," "administrators," or "bureaucrats" — run these organizations and society. The most rapidly expanding organizations are in the public sector, which now consumes nearly 40 percent of GNP and employs one of five workers.
2. Because of this organizational and managerial growth, a "new class" has arisen. This "new class," trained mostly since World War II, are college educated: editors, journalists, scientists, teachers, educational administrators, television commentators, city planners, psychologists, managers in the upper reaches of government bureaucracy, and public health physicians or lawyers in the public sector.

   This new class shares certain characteristics: (a) they are interested in "being" someone rather than "having" possessions; (b) they are "idealistic," i.e. they do not care about money but being the elite that exercises power; (c) they feel compelled to provide common people with what they "need," e.g. mass transit, rather than what they "want," e.g. cars; (d) they have little or no experience with the market system; indeed they are suspicious of anyone, e.g. businessmen or fee-for-service physicians who deal in market transactions; and (e) they believe ultimate power should reside in the government, where they will have the major say in intervening in the private sector and redistributing power for the "common good" and "social justice." According to Irving Kristol, a neoconservative, the "new class:" ". . . *are* the media — just as they *are* our educational system, our public and welfare system, and much else."[3] *They* also *are* competing with businessmen, professional people, tax reform groups, and populist politicians for power. Unfortunately, the "new class" has little economic common sense, i.e. appreciation of where the money comes from.
3. Power is shifting from major political parties to issue-oriented groups. This new political reality has occurred for various reasons — new ethical requirements for legislators, activities of Common Cause and consumer groups, retirement of powerful politicians of old school, and, emergence of complex technological issues such as energy, pollution control, and health care that cut across party lines and require special knowledge. *Fortune* says: "Congress has splintered today into a pluralistic collection of independents and mavericks, knowing no party loyalty."[4] This same splintering has occurred in state legislative bodies. Result? Fierce lobbying on specific issues at all levels of government. Lobbies with the best staff work, the most facts, and the best knowledge of the legislator's constituency win the day.
4. The most recent social phenomenon is the new conservatism, now manifesting itself as the "tax revolt." Because of government's poor performance in Great Society and welfare programs, disillusionments of Watergate, and inflation with increased taxation, the middle class has come to realize the government is inherently inefficient and that the burden for any system of "transfer-payments" — Social Security, Medicare, and Welfare — falls mainly on the middle class. There are never, it seems, enough rich people to go around. The middle class also feel wealth is "transferred" to the not-so-poor, who have more social benefits than the paying middle class.

Response to Social Forces

These, then, are major social forces organized Medicine must consider. To compete effectively politically, we must build strong organizations, hire or develop effective managers, understand how the new class thinks, concentrate on lobbying, and capitalize on the effects of the new conservatism on the public. The new conservatism has achieved intellectual respectability. That, in itself, is a breakthrough.

But to sustain this respectability, we must have reasonable goals. In health care, these would include a restructured, flexible health system that would: (1) provide reasonable choices of types of care; (2) provide financial protection and access to these choices; (3) distribute care equitably; and (4) give good care at a price society can afford.

Strengths of Minnesota Health System

Finally, we must work from the strengths of our particular region's health system. To do that, we must recognize those strengths. In Minnesota, these strengths are:

1. a highly experimental and innovative attitude among health care professionals — from politicians, to administrators, to physicians.

TABLE 3

	Minnesota	United States
Percent of Physicians in any group practice	43.7%	17.6%
Percent of Physicians in single specialty groups	13.4	6.2
Percent of Physicians in family practice groups	5.1	1.0
Percent of Physicians in multispecialty groups	25.3	10.4

2. a well-established tendency among physicians to join groups, as noted in this Table 3.

3. a willingness, both among citizens and physicians, to accept HMOs as a competitive force in the community. Minnesota has eight HMOs, more per capita than any other state. In the Twin Cities, HMOs have 190,000 members — 10 percent of the population. One HMO, the Physicians' Health Plan, has 90 percent of the physicians in the Metropolitan Region participating and 23,000 members. The Health Plan broke even after two and a half years, but only after going deeply in the red the first year, then imposing these rules, some of which have been relaxed since the Plan became solvent:

   Controls Imposed by Physicians on Themselves in Physicians' Health Plan

   1. Paid themselves only 70 percent of standard fees
   2. Asked physicians to file monthly reports detailing what they did
   3. Required permission to admit nonemergency patients to hospital
   4. Allowed plan to review status of hospital patients
   5. Allowed plan to analyze their office practices

   Another HMO in Minneapolis is a multispecialty clinic (The St. Louis Park Clinic) that employs 100 physicians and also practices fee-for-service medicine alongside their pre-paid plan for 40,000 members. Physicians find these two systems of practice can be carried out side by side.

   In matched populations, HMOs reduce hospitalization rates by five to 40 percent. Yet HMO's do not "maintain health" or prevent disease. As elsewhere, we have mixed emotions about HMOs. We invite them to compete, to vie for beds, and to form. But we know HMOs will probably care for no more than 20 percent of the population (if the Permanente experience is any indication). Also, for sound financial reasons, HMOs are reluctant to enroll the poor, the infirm, the old, the sick, the psychotic, or the alcoholic. HMOs have other limitations: large capital investments and years to reach a break even point, lack of attractiveness to many patients and physicians, and a failure to catch on in rural regions. But HMOs are a legitimate alternative for care, and they do make us all aware how to cut costs, even fee-for-service physicians practicing in the same area. In Minnesota, the medical profession accepts HMOs as a competitive force. Which is why, of course, Twin Cities physicians formed their own HMO.

4. More emphasis on primary care. Fifty percent of Minnesota physicians are in primary care, compared to 40 percent for the rest of the U.S. Also 65 percent of University of Minnesota Medical graduates now go into primary care. The University ranks second in the country in this regard. Finally, 42 percent of their graduates are going into family practice, versus 13 percent for the rest of the country. Each year forty of these family practice students participate in a rural preceptorship program, and 70 percent of these students return to the site of their preceptorship to practice Medicine.

5. An enlightened group of hospital administrators who are willing to change to adapt to the times. Within the Twin Cities, at least eight new organizations have formed in the last ten years for purposes of merging, affiliating, or cooperating with other institutions. Six of these organizations have budgets over $35 million dollars and are sharing, centralizing, decentralizing, or otherwise doing what it takes to survive. They are also innovating. Minnesota is a national leader in the concept of organizing multihospital units in one system, in setting up one day surgical units, in devoting beds to alcoholic rehabilitation (we now have more than 15 percent of all alcoholic rehabilitation beds in the country, which may be a good thing, because Minnesotans, on the average, drink 50 percent more than the average U.S. citizen), and have been leaders in setting up a National Health Rehabilitation Center, with seed money from the Norwegian government, called Vinland Center, to teach and promote positive approach towards health habits.

6. Different patterns of health facilities usage. For example, because of the flurry of mergers and consolidations, Minnesota now has fewer hospitals than five years ago; a lower occupancy rate that is dropping faster than the rest of the country; and a much lower rate of hospital outpatient visits than the rest of the country. Our hospital expenses are less, and we have less employees. In nursing homes, we have twice as many beds per capita, but less employees. Our average hospital cost inflation rate has been 12 percent these last five years, compared to 15 percent for the rest of the U.S.
7. A tradition of forming organizations to monitor and evaluate health care. In 1969 the Hennepin County (Minnesota's most populous county) Medical Society formed a foundation, later called The Foundation for Health Care Evaluation. The Foundation encourages physicians to participate and encourages insurance people, industry representatives, consumers, and providers to cooperate. Membership includes 2,042 physicians (nearly ½ the physicians in Minnesota) from the seven county metropolitan region. At first, the Foundation dealt mostly with evaluating whether fees were appropriate. In 1972 it undertook the duty of hospital utilization review, then in 1974 was recognized as the PSRO for the Twin Cities. In the last six years, the Foundation has reviewed 6000 contested fees and reduced 63 percent of them by $332,621. It has also initiated a data system, evaluation activities, and made audit studies of such procedures as D & Cs and hysterectomies.

Minnesota Medical Association and Establishment of Division of Socio-Economic Affairs

So much for background, now a few comments on the role of the Minnesota Medical Association.

In January 1975, Congress passed Public Law 93-641, the law that divided the country into 205 Health Service Areas, each with its own Health Service Agency, to be dominated by consumers. The aim was to "democratize" health planning, to have the states set up control agencies to coordinate HSAs, and, presumably, to establish the administrative framework for a future national health insurance plan. The Association responded to this ambitious federal plan, to state legislative activity, to the malpractice problem, and other socio-economic problems, by increasing dues by $100 in 1975, $50 of which was earmarked for the new Division of Socio-Economic Affairs. The budget of this Division was $285,000 in 1976, $299,000 in 1977, and $394,000 in 1978. The 1978 portion represents about 40 percent of the Association's total budget.

In other words, the Association has devoted time, money, and resources to Socio-Economic affairs. Why? To meet the social changes I have described and also to cope with federal plans to reform the health care system. The Minnesota Medical Association feels, although the government is pervasive, it is not necessarily effective. Indeed, the government is

Units of Socio-Economic Division	Roles and Duties of Unit
Department of Legislative Affairs	**Monitors state legislation, represents the association before the State Legislature, prepares analyses and summaries for Committee on Legislature, helps in deciding policy decisions, and works with Staff counsel in legal analysis of bills before legislature. Usually closely follows about 40 pieces of health-related legislature through each session. This department also tracks national legislature, maintains liaison with AMA, and provides information to Political Action Committee on voting records of Minnesota Legislative members.**
Department of Health Planning	**Staffs committee of Health Planning and decides Association's approach to health planning in seven HSAs in Minnesota. Each HSA has a Board with Task Forces. Health Planning Department forms boards in parallel with HSA's task forces and appoints Reference Groups in parallel with Task Forces.[6,7] Idea is get physicians involved and to focus their wisdom, knowledge, and advice on HSA Task Forces. By being cooperative, honest, and informative, physicians have earned respect of HSAs.**
Department of Medical Services & Research	**Staffs Committee on Medical Service, which deals with state and federal regulatory agencies, medical insurance carriers, HMOs, nursing home regulations, PSROs, health screening programs, second opinion surgery projects, and cost containment. Maintains a close relationship with State Department of Public Welfare, which usually does not make major decisions without consulting with Committee.**

surprisingly weak, especially in its knowledge of health care matters. Therefore, the government will benefit from concentrated physician knowledge, participation, and decision-making.

To form its Socio-economic Division, the Association hired a Director, his assistant, and a staff counsel. The Division now has a staff of 11 and is comprised of three units. (chart page 413).

Cost Commission

A year ago, as an outgrowth of its Division of Socio-economic Affairs, the Minnesota Medical Association formed a Cost Commission that included representatives of the insurance industry, business, labor, government, think tanks, institutions, and hospital groups. The Commission will deliberate for 18 months, will invite speakers and papers representing different sectors, and will publish a report of the Commission's conclusions.

alternatives we have, one from a State legislator who spoke for consumers who were worried about uneven access and excess costs, and one from an InterStudy health economist who came out strongly for restructuring the private system, i.e. offering the public its choice of competing health plans, and minimizing government regulations.

The Commission also commissioned a health economist to study Minnesota's unique health system and how it differs from other states. This 108 page report is now available and is called "Containment of Health Care Costs — The Case of Minnesota."

The idea of the Commission, according to Chairman, Richard J. Frey, is simple: "We've got to get everybody involved to make changes — doctors, institutions, third parties, and patients." Doctor Frey has set up four task forces — providers, consumers, third party, and institutions — and their aim is to make

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Tobey Lapakko
Minnesota AFL-CIO

Robert Hanson
Reserve Mining Power Plant

I cannot say now, when we are only 12 out of 18 months into the deliberations, what the Commission will conclude. As Editor of *Minnesota Medicine*, I am not directly involved in the Commission's work. But I am indirectly involved. Our Journal regularly publishes formal presentations before the Commission. Three articles have appeared — one from a University of Minnesota Health Economist who analyzed the specific recommendations for change. To give an example, one task force is concentrating on the pre-admission testing and in-office surgery as a means of saving money. Another has enlisted the aid of Minnesota state specialty societies. Each specialty is preparing a list of the ten most common reasons for hospitalization, the ten most common operations, and recommending how they can cut the cost of each.

Optimistic Conclusion

I would like to end on an optimistic note. I think it is generally agreed, even by liberals, that a comprehensive centralized National Health Insurance plan, administered in Washington, is a dead concept. A limited catastrophic insurance is much more likely. Also the rapid growth of federal bureaucracy is coming to an end. Finally there is growing consensus that government cannot solve all problems, and among things the government does badly, is regulating health costs.[12]

We are going to have to solve cost problems as individuals and as members of cooperating and competing pluralistic organizations. Leaders from different private sector organizations of Medicine are beginning to meet and to talk, coordinate, and unify their approach and relationship with the government.[13] In Minnesota, we firmly believe private initiatives by physicians — through individual patient decisions, through thoughtful decision making in health care, through organizing new alternatives to deliver care, and through monitoring our own behavior — offer a better and more effective choice than government regulation.



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Cover Photograph

"Salute to America"

The cover photograph was taken at Fort Snelling by William T. Luckey, M.D. with a Konica T-3 using the new Kodachrome 25 film (rated at IE 40 for more color saturation). Dr. Luckey first attempted this shot three years ago with a normal lens and getting very close to the cannon. The "boom" produced both a blurred picture and a shaking physician.

Dr. Luckey, determined to get this particular picture, went back to Fort Snelling in July, 1976, armed with a monopod and a 135 mm lens. He tells the Editors that he guarded very carefully his chosen position for over an hour in the sun, made a half-human tripod (two legs and the monopod), and quit breathing a few seconds. Dr. Luckey says the crucial point is to hit the button at the right time (using 1/250 seconds).

The May, 1978, issue of MINNESOTA MEDICINE has as its cover his photograph "Valley Fair."

He is presently at St. Joseph's Hospital in Milwaukee taking a residency in radiology.

IN APPRECIATION

We are sincerely pleased to acknowledge the firms listed below who participated in the 1978 Annual Meeting Exhibit. The exhibits were attractive and informative. The financial support provided by these exhibitors contributes significantly to meeting the costs of our fine scientific program and related activities. May we urge that you personally acknowledge this support to representatives of these firms as the opportunity to do so may occur. We heartily invite their participation in the 1979 Annual Meeting Exhibit at the St. Paul Radisson on May 16-17-18.

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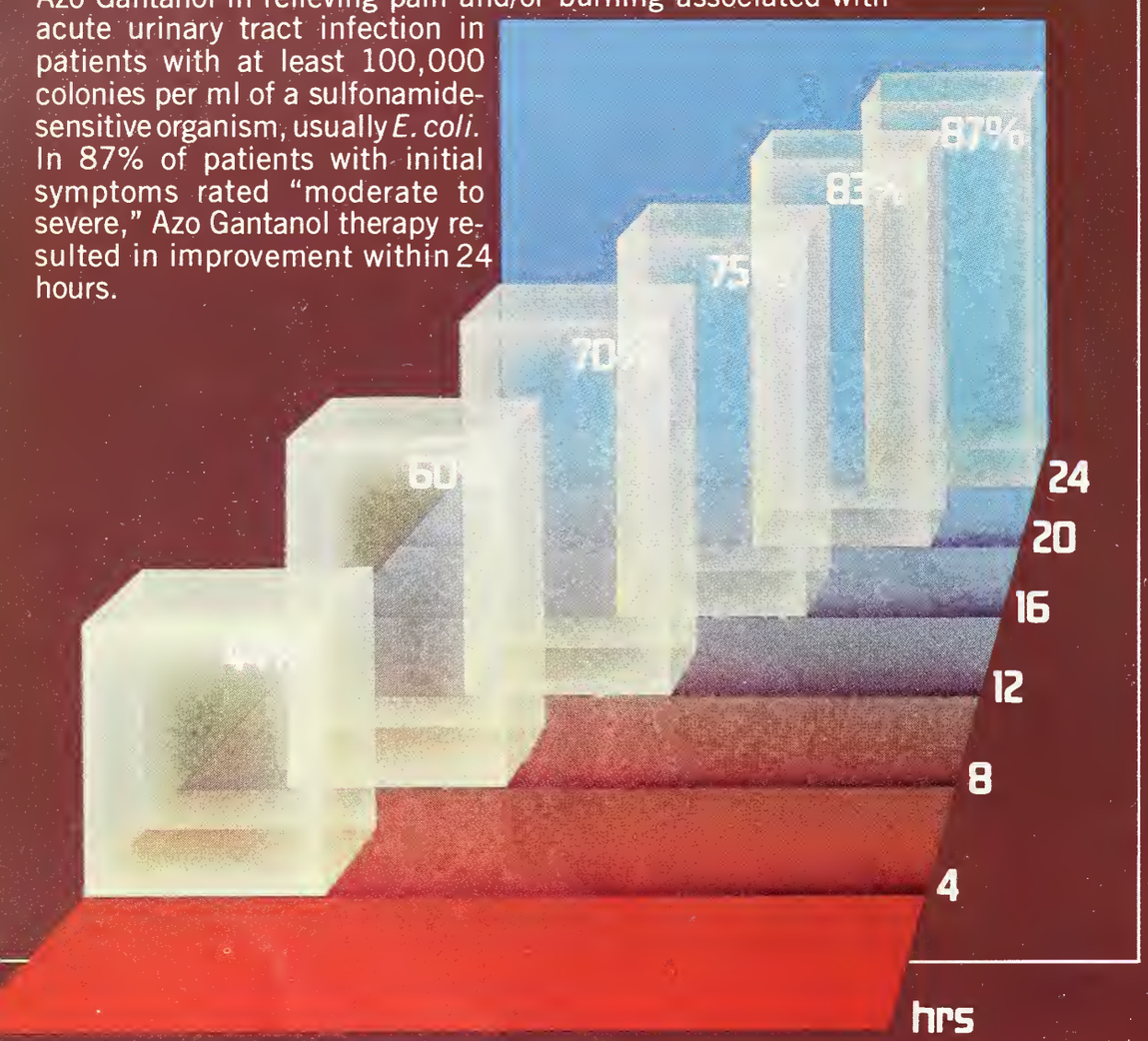
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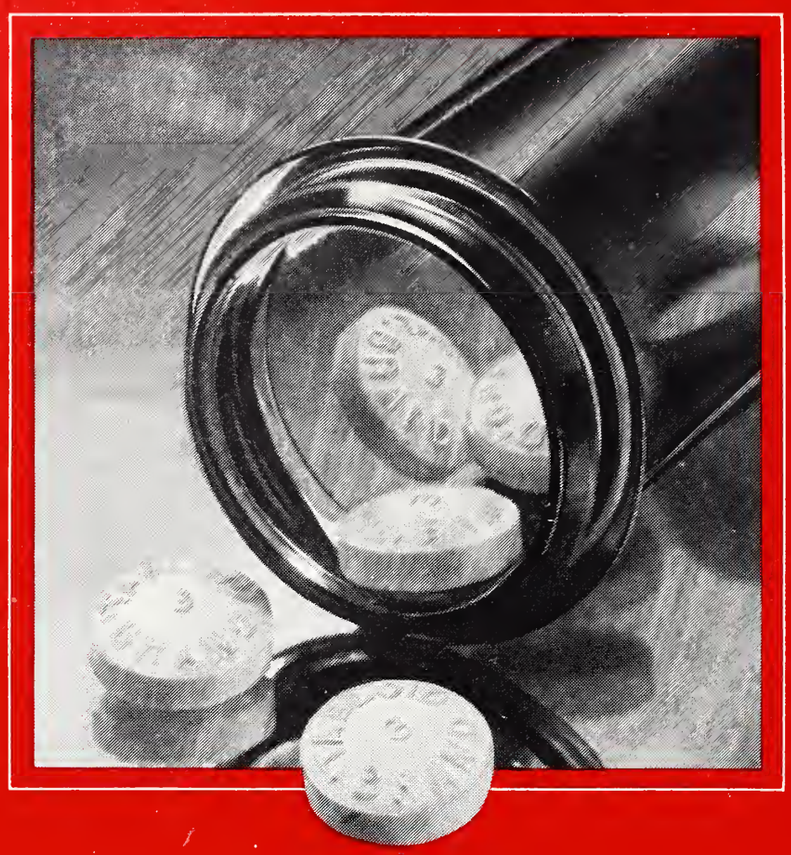
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Hemi-Facial Spasm
A Microsurgical Approach

DONALD L. ERICKSON, M.D.* and SHELLEY N. CHOU, M.D.*

Hemi-facial spasm is a most distressing problem to those afflicted and is a difficult entity to successfully treat. Although the phenomenon is frequently triggered by stress, there is evidence to suggest that it has a physiologic basis, perhaps due to neurovascular compression. Previous surgical treatment has been aimed at destruction of part of the seventh nerve, thereby leaving the patient with a disfiguring facial paresis. The described microsurgical treatment is an attempt at resolving the spasm without producing paresis and is accomplished by separating the offending vessel from the root of the facial nerve.

THE ETIOLOGY and treatment of hemi-facial spasm has been somewhat of an enigma. The advent of microneurosurgery has fostered a resurgent interest in a mechanical etiology based on vascular compression and irritation of the seventh nerve in the posterior fossa. Several surgeons have reported series of patients whose hemi-facial spasm was successfully treated by separation of the offending artery from the seventh nerve in the posterior fossa.[1,2,3,4] Whereas previous surgical procedures have only been effective when significant facial paralysis was produced, this present form of treatment can be successful without that unpleasant sequela. Although microsurgical exploration of the seventh nerve in the posterior fossa has potentially serious surgical risks it may be warranted where the condition is persistent and distressing to the patient.[4] Although it seems unlikely that this mechanism represents the only etiology of hemi-facial spasm, it is perhaps the most satisfactorily treated.

Description

Ehni reviewed 106 cases of hemi-facial spasm at the Mayo Clinic with an excellent description of the syndrome.[5] He did not find a specific etiology. None of the patients was younger than 35 years and the fact that this is an adult onset problem is well substantiated in the literature. Twelve of his patients had persistence of hemi-facial spasm during sleep, strongly suggesting a physiological rather than a psychological etiology. Only five of those patients were described as psycho-neurotic, although fatigue and tension were common precipitating factors of the spasm. Fourteen of his patients had partial ipsilateral deafness, which would be a clue to the possibility of a mechanical etiology in the posterior fossa where the 7th and 8th nerves are intimately associated.

Schloss and Bebear stress the importance of thorough investigation of patients with hemi-facial spasm.[6] They presented a series of patients who had mass lesions in the cerebellopontine angle as a cause of hemi-facial spasm. Rarely, however, did these patients present with an isolated hemi-facial spasm, but more often had spasm as part of their clinical course and most often developed a facial paresis before the diagnosis was made. Typically, they had other associated neurologic findings accompanying the hemi-facial spasm. Certainly, in our experience, mass lesion has not been a common etiology of hemi-facial spasm.

The suggestion of a vascular mechanical irritating etiology is by no means new. In 1878 Schultze had pathologic evidence of a vertebral artery aneurysm compressing the 7th nerve in a patient with hemi-facial spasm.[7] Gowers in 1883 had a similar patient with cirsoid aneurysm of the basilar artery.[8] The advent of angiography made premortem diagnosis possible and two patients were reported by Campbell in 1947 with cirsoid basilar artery aneurysms.[9] Gardner reported an operative series in 1962 in which 13 of the patients with hemi-facial spasm were found to have compression of the 7th nerve by some aberrant vascular structure.[3] A recent report by Neagoy describes the angiographic findings, as well as the successful surgical results in 13 of 14 patients.[2] Janetta found at

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See editorial, page 431.

surgical exploration, some type of vascular compression in 31 consecutive patients, but these were not all abnormal or ectatic arteries.[1] He believes that even a normal artery crossing the nerve in a particular manner can produce the syndrome.[10]

Surgical Treatment

Previously, most surgical treatment has been directed toward that portion of the facial nerve distal to the internal auditory meatus. Cawthorne found that decompression of the nerve within the bony canal was not effective unless accompanied by some postoperative paralysis.[11] A variety of total and partial nerve sections have been devised but once again their success seems to relate to the degree of permanent paralysis produced.[12,13] As facial nerve function recovers, facial spasm generally returns with it. Patter reported a procedure for terminal seventh nerve branch section where the early results showed some improvement without producing significant paralysis.[14] The previous body of evidence, however, would suggest that this is no more likely to work than partial sections elsewhere in the nerve.

The most encouraging information in the literature regarding surgical treatment to date is the microsurgical decompression procedure described by Janetta.[1] In this procedure, the facial nerve is explored through a small lateral suboccipital craniectomy Figure 2(A). The operating microscope is used to visualize any abnormal compression of the facial nerve by vascular structures. The offending vessel is then separated from the nerve. Decompression is maintained by placement of a small tab of nonreactive material or muscle. A recent case of ours will serve to illustrate this form of treatment.

Case Report

A 67-year-old gentleman had a 15 to 20 year history of left hemi-facial spasm. Over the past several months, it had become more severe and disturbing. On examination, he had no evidence of neurologic deficit but did have marked hemi-facial spasm which occurred spontaneously but also regularly with any attempt to speak or move the facial muscles. Plain skull Xrays were normal. An angiogram demonstrated a large anterior inferior cerebellar artery, with a prominent loop extending into the cerebellopontine angle (Figure 1). On May 6, 1977 a suboccipital craniectomy was performed and the main trunk of AICA was seen looping over the 7th nerve with one portion of the loop close to the root entry zone and the other limb closer to the internal auditory meatus (Figure 2(B)). A small branch left this loop and accompanied the 7th and 8th nerves distally. The artery could be readily separated from the 7th nerve and a silastic patch was inserted between the nerve and the artery (Figure 2(C)).

Postoperatively, the patient had a mild facial palsy with no evidence of hemi-facial spasm. As the paresis cleared over the next several days, a mild degree of hemi-facial spasm returned. At two months following surgery, he had no evidence of paresis and only an occasional spasm in the orbicularis oculi.

Discussion

Most observers agree that the pathology in hemi-facial spasm occurs as a lower motor neuron phenomenon, somewhere between the facial nerve nucleus and the stylomastoid foramen. Evidence negating a more central etiology is the observation that

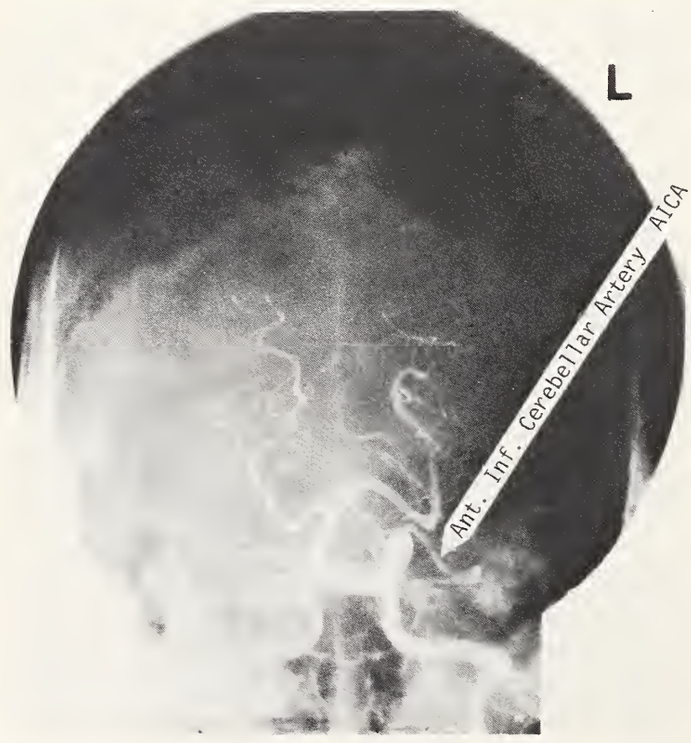


Fig. 1—Vertebral angiogram.

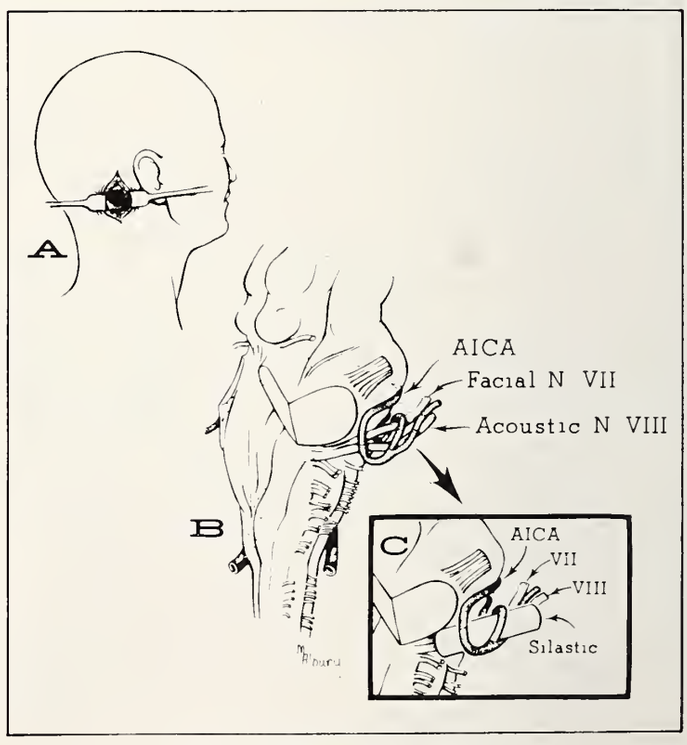


Fig. 2—Surgical exploration.

hemi-facial spasm patients incurring a cerebrovascular accident and hemiplegia ipsilateral to the spasm, continue to have the hemi-facial spasm.[5] Also, a dog with facial spasm underwent a series of ablative procedures beginning with the cerebral cortex and progressing more centrally. It did not have cessation of spasm until the facial nerve nucleus was destroyed.[15]

It seems also unlikely that pathology distal to the stylomastoid foramen would be responsible in view of the results with various surgical procedures. Section of the 7th nerve distally resolves the spasm only until regeneration of the nerve occurs. Moreover, if the nerve is sectioned at the stylomastoid foramen and anastomosed with the 11th or 12th nerve, spasm does not return to the face even though reinnervation of facial muscles does occur.[12,13] Decompression of the nerve within the facial canal has not resolved the problem.[16,17] It would seem therefore that the most likely area for pathology is that section of the nerve between the brain stem and the internal auditory canal. This is also the area where vascular impingement occurs.

Janetta has proposed an even more specific location which is the root entry zone where the myelin changes from peripheral nerve to central nervous system composition.[10] Presumably, this area would be more vulnerable to minor trauma because of its incomplete myelin coverage. Ruby and Janetta have shown ultrastructural changes in the myelin of the 7th nerve in patients operated upon for hemi-facial spasm.[18] Certainly, the favorable results in this form of treatment would lend some additional support to the vascular compression etiology concept.

Much has been made about the emotional aspects of hemi-facial spasm, and tension is often a precipitating factor. In view of this newer information, one would wonder if that is indeed a significant etiologic factor or if we are simply dealing with distraught patients who are emotionally upset because of the persistence of an unresolved problem.

Summary

Encouraging results are being reported in the surgical treatment of hemi-facial spasm. The refinement of neuro-vascular decompression by use of the operating microscope has made this a relatively safe and useful procedure. Hopefully, this treatment will provide some patients lasting relief from this disturbing problem without the unpleasant sequela of permanent facial palsy.

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Continuing Medical Education

Third National Conference on "The Impaired Physician" will be held September 29-October 1, at the Sheraton Ritz Hotel, Minneapolis. Special brochures being mailed by the Minnesota Medical Association to all physicians.

Conference sponsored by the American Medical Association and the Minnesota Medical Association.

Spontaneous Perforation of Diverticulum of Distal Esophagus

ALAN J. STALHEIM, M.D.*

Spontaneous perforation of the epiphrenic giant esophageal diverticulum is a rare occurrence and even rarer reported survival. Survival is dependent upon aggressive therapy.

SPONTANEOUS RUPTURE of an epiphrenic esophageal diverticulum is rare and has a high mortality.

An 82-year-old retired carpenter developed one afternoon severe nonradiating epigastric pain. There was no precipitating event such as straining, wretching, coughing, or trauma.

Prior to this time, he had no symptoms referable to the esophagus and his weight had been stable.

There was evidence of mild atherosclerotic cardiovascular disease.

A barium study of the upper gastrointestinal tract in 1970 was normal.

On admission the patient was in moderate distress. The blood pressure was 160/80 mm/Hg, pulse 90/min, respirations 30/min, and the rectal temperature of 99.6°F.

Auscultation of the chest disclosed a regular cardiac rhythm and bilateral inspiratory rales.

He had epigastric tenderness with guarding and absent bowel sounds.

His white count was 11,800 with a left shift and the chest film showed mild congestive heart failure.

A Gastrografin† study of the stomach did not show leakage of the material. Unfortunately, he was not able to swallow and this material was instilled via the nasogastric tube. Antibiotic therapy was instituted.

By the next morning he felt better, his congestive heart failure had improved and his white count was still shifted to the left at 8,000.

An upper gastrointestinal series with barium was then carried out and this time he was able to swallow. Barium was found to enter a large smooth cavity arising from the distal esophagus. No communication with pleural space was seen. As his overall condition was stable, conservative therapy was continued.

On the morning of the 3rd hospital day, he suddenly developed severe pain in the epigastrium and left lateral chest. X-ray examination revealed migration of the barium into the left pleural space.

He was taken to surgery immediately and through a left thoracotomy, a 12 cm. purulent cavity in the posterior mediastinum was found. It was well walled off and had caused the aorta to angulate. This communicated with a 4 cm. longitudinal rent in the esophagus located 6 cm. proximal to the esophageal hiatus.

Debridement, irrigation and a two-layered closure

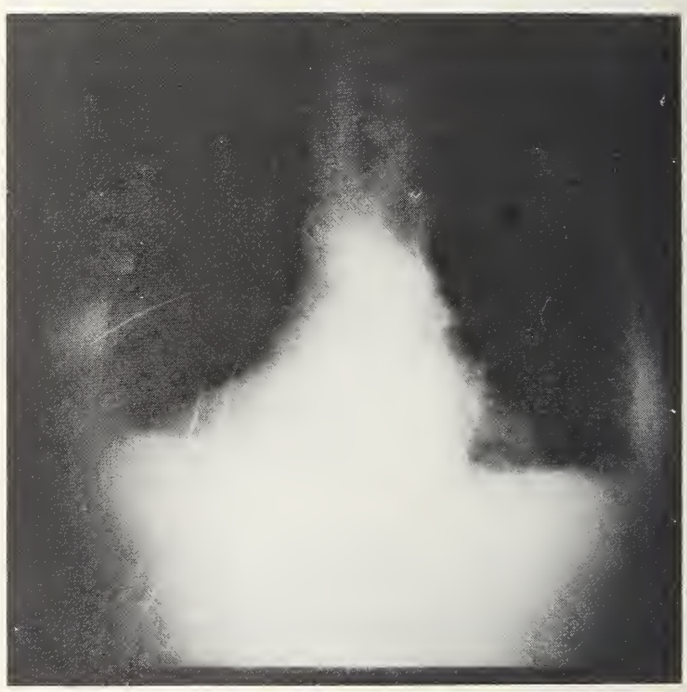


Fig. 1—Admission

As presented at the Southern Minnesota Medical Association Meeting at Albert Lea, Minnesota, September 25, 1976.

*Albert Lea, Minnesota.

†Meglumine Diatrizoate, Squibb.

of the redundant esophageal wall was carried out. After a long convalescence the patient recovered; a follow-up esophagram revealed no diverticular residual. Microscopy of the debrided diverticular wall revealed chronic inflammatory reaction.

Discussion

Epiphrenic diverticula are exceedingly rare more so than traction diverticula of the middle third of the esophagus.[1] A series of 15,000 autopsies by Mellis[2] disclosed 14 traction diverticula, none of which had ruptured. In over 20,000 esophagrams Wheeler found only three epiphrenic diverticula.[3]

A review of the English literature disclosed only two case reports of esophageal diverticular rupture. Both were of the traction variety and both expired.[4,5] In a series of 149 nonsurgical cases of lower esophageal diverticula, rupture was not mentioned as a complica-



Fig. 2—Barium Study Preop showing the epiphrenic diverticulum without leakage.

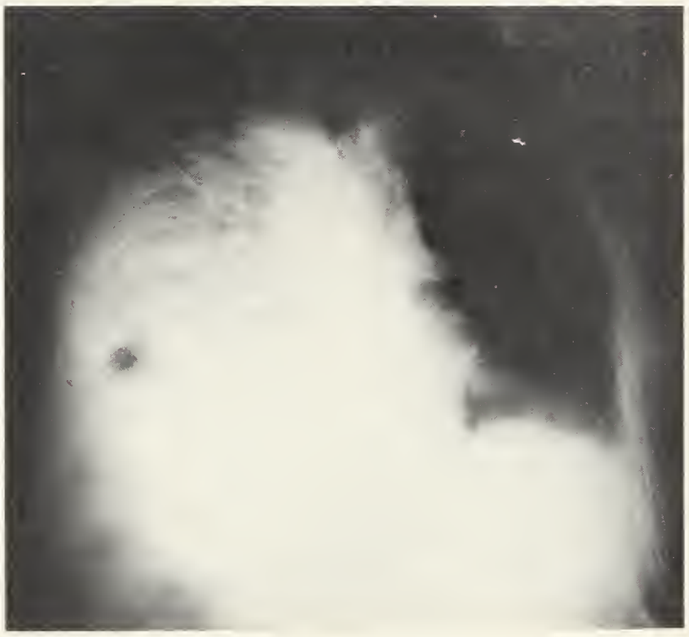


Fig. 3—Chest Xray showing migration of barium into the left chest.



Fig. 4—Immediate Post Op.



Fig. 5—Discharge UGI.

tion.[6] Other articles mentioned ulceration and/or perforation but did not document this.[3,7]

Most large epiphrenic diverticula are symptomatic and have associated disease such as achalasia, neuromuscular dysfunction, or hiatal hernia.[8]

Epiphrenic diverticula lie in the distal third of the esophagus, either on the right or on the left-side. Their symptoms include: dysphagia, substernal pain, belching, regurgitation of undigested food, and coughing from aspiration. Weight loss is associated with the dysphagia.

Elective resection of the symptomatic diverticulum and correction of the associated disease must be considered. This is directed at eliminating the elevated intraluminal pressure on the healing suture line.[8] Diverticular recurrence has been reported when associated disease has not been corrected.[9] The differential diagnosis includes perforated peptic ulcer with or without sealing, pancreatitis, myocardia infarction and pulmonary embolus. Absence of findings at laparotomy in this situation has been reported.[10]

Summary

Esophageal diverticular rupture with the ensuing mediastinitis requires prompt and aggressive antibiotic and surgical therapy. Survival depends on closure of the diverticulum, wide debridement and generous mediastinal drainage.

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Skateboard Injuries

KRISHNA M. SAXENA, M.D.* and JAMES MOLLER, M.D.*

There has been an alarming increase recently in skateboard-related injuries. Injuries occur mostly in adolescent males and, primarily, in the upper extremities although they may also involve other parts of the body including serious head injuries.

Preventive measures such as a proper attire, helmets, provision of special parks or areas for skateboarding, and restriction of skateboarding on streets and highways can greatly diminish the frequency and morbidity from skateboard accidents. The physicians have an important role in providing anticipatory guidance to the public and leadership for legislative enactment of preventive measures.

SKATEBOARDS FIRST became popular about 15 years ago. The early skateboards with clay wheels were clumsy, noisy, and relatively slow. A new type with polyurethane wheels has a smoother ride, and speeds of up to 57 miles per hour have been reported.[1] In the last five years, skateboard riding has become a sports craze of epidemic proportions. Along with the popularity of this sport has come an alarming increase in skateboard-related injuries, such as fractures, contusions, lacerations, cerebral concussions, and death.

Between 1973 and 1975, a ten-fold increase in accidents from skateboards was reported by the National Electronic Injury Surveillance System, a branch of the Federal Consumer Product Safety Commission.[2] During 1976, the nation's emergency rooms treated 71,438 accidents due to skateboards. The total estimated number of injuries rose from 72,000 in 1975 to 188,000 in 1976.[1] The projection for 1977 was 375,000 injuries or 30 times that in 1973.

Most of the skateboard injuries occur among adolescents. The peak age is 10-15 years.[3] The male to female ratio is about 4:1. The adult and taller rider has a much greater chance of falling from the skateboard because of the narrow angle for dynamic equilibrium. In fact, injuries have been reported in a number of adult men, including a congressman from Minnesota, who were trying their children's skateboards.

Injuries occur most commonly in the upper extremities (50%) with the lower extremities (20%), the head and/or face (15%) and the upper trunk (8%) being involved less frequently.[3-5] Fractures have occurred in a third of patients with skateboard injuries brought to the hospital for treatment. Fractures most commonly involve the radius, ulna, clavicle, tibia, and fibula, but skull fractures also occur.[6] Some types of injuries are peculiar to or common in skateboard riding. These include: (1) the skateboard elbow (a shattering of the olecranon process): (2) crush injuries of the hand or foot secondary to manhole covers dropping on children trying to recover skateboards from storm sewers; and (3) distal radial fractures often involving radial epiphysis sustained by falling on an outstretched hand. A correlation was noted between the direction of the fall, the front foot and the side of injury, (that is, with his left foot forward, a skateboard rider typically fell to the left and sustained a left-sided injury).[4] For injuries of the hand or wrist, the ratio of left to right was three to one.[4] Abdominal injury, including ruptured spleen and fractured kidney have been reported. Not surprisingly, the majority of injuries due to skateboards have occurred on public property, such as streets, sidewalks, parking lots, drained swimming pools, and storm drainage canals. On the streets, skateboards are particularly hazardous because of automobiles and other vehicles. Many of the deaths of skateboard riders have occurred when they collided with an automobile.[5] At least 25 deaths due to skateboard injuries have been counted.[7]

Protective and preventive measures are needed to decrease the frequency and morbidity of skateboard accidents. The physician, especially the pediatrician and family practitioner, can play an important role in providing accident-prevention information for children and parents. A number of measures could be taken to decrease the severity of trauma among skateboard riders. Wearing of protective attire, for example, long

*Department of Pediatrics, University of Minnesota, and the Children's Hospital, St. Paul, Minnesota.

pants and long-sleeve shirts can minimize abrasions and contusions of the extremities, although not fractures. Wearing shoes decreases foot fractures.[4] Consideration should be given to making wearing of helmets compulsory so that severe head trauma could be prevented. Banning of the sport is unrealistic. However, the accident and mortality rate could be curtailed significantly if skateboarding were allowed only in special parks or "fields" where safety measures could be observed. Although a recent experience in San Diego showed the impracticality of totally banning the sport on the streets,[5] it can and should be barred from major roads and heavy traffic areas.

Physicians can and should provide not only anticipatory guidance to the public but should provide leadership for legislative enactment of protective and preventive measures for skateboard injuries.

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Continuing Medical Education

July, August, September

July 6-8 — Seminars in Rheumatology, Arrowwood Resort, Alexandria. Sponsor: MMA* Committee on Rheumatic Diseases. 15 hours Category I/Prescribed. MMA, 101 E. 5th Street, St. Paul, 55101 (612) 222-6366.

July 11 (Sept. 7 & Nov. 7) — Red River Valley Medical Society Meetings. Sponsor: Red River Valley Medical Society. 1½ Prescribed hours. Arnold Berg, M.D., (218) 681-4747.

July 15-16 — AMA Regional CME Meeting, Minneapolis. Sponsor: AMA Council on Continuing Physician Education, U of M, MMA*. Hour for hour Category I/PRA: Six courses — six hours each. AMA Department of Meeting Services, 535 North Dearborn Street, Chicago, IL 60610 (312) 751-6503.

July 19 — Hibbing Medical Seminar (Gastrointestinal), Hibbing General Hospital Lecture Hall. Sponsor: Physicians of Hibbing & Chisholm, Hibbing General Hospital, Range Chapter of the MAFP, Mayo Clinic*. G. Marking, coordinator.

July 26 — Update in Colo/Rectal Carcinoma, Pillsbury Auditorium, Minneapolis. Sponsor: Metropolitan Medical Center*. 2½ Prescribed hours. Robert Hammerstrom, M.D., (612) 336-2525.

July 28-29 — Sexual Attitude Reassessment Seminar, Research East Bldg., 2630 University Avenue, SE, Minneapolis. Sponsor: U of M*. 14 Prescribed hours. Program in Human Sexuality: (612) 373-9699.

July 28-31 — Faculty Development: Teaching Skills Workshop, Spring Hill Center, Wayzata. Sponsor: U of M*. 24 Prescribed hours. Carole Bland, Ph.D., (612) 376-3689.

August 17 — Hibbing Medical Seminar (Internal Medicine), Hibbing General Hospital Lecture Hall. Sponsor: Physicians of Hibbing & Chisholm, Hibbing General Hospital, Range Chapter of the MAFP, U of M*. J. Chalgren, coordinator.

September 1 — Holter Monitor, St. Francis Hospital, Shakopee. Sponsor: St. Francis Hospital. 1 Prescribed hour. C. R. Heinzerling, M.D., (612) 448-2050.

September 20 — Lung Disease in Infants & Children, Holiday Inn-Capitol, St. Paul. Sponsor: Ramsey County Lung Association. 6 Prescribed hours. Edward Strem, M.D., (612) 698-0386.

September 20 — Hibbing Medical Seminar (Nephrology), Hibbing General Hospital Lecture Hall. Sponsor: Physicians of Hibbing & Chisholm, Hibbing General Hospital, Range Chapter of the MAFP, Mayo Clinic*. F. Tycast, coordinator.

*Liaison Committee on Continuing Medical Education Accredited.

Review

Acupuncture in Treatment of Chronic Pain and Post-lumbar Puncture Headache

One Year's Experience

JU HAO LEE, M.D.* and JOSEPHINE LO, M.D.*

Three hundred eighteen chronic pain patients and 30 patients with post-lumbar puncture headaches were treated with acupuncture. Of the 269 chronic pain patients who responded to our survey questionnaire, 47.6% reported good relief, 17.5% fair and 34.9% no relief six months after treatment. 96.7% of the post-lumbar puncture headache patients reported complete relief.

ACUPUNCTURE CLINIC at Mt. Sinai Hospital, Minneapolis, Minnesota, was established in August 1973, for clinical evaluation of effectiveness of acupuncture on numerous disease entities as reported in Chinese and Japanese literature. This report summarizes our one year's experience in the use of acupuncture for treatment of chronic pain.

Patient Source and Methods

In a twelve month period, we treated three hundred and eighteen patients for chronic pain with acupuncture. All were referred and most had undergone various diagnostic and therapeutic procedures without relief.

Thirty additional patients were referred for the treatment of post-lumbar-puncture headache.

The technique of acupuncture treatment for various pain problems was based on the Chinese classical method[1]. The needles, one-half inch to two inches in length, were connected to battery-operated stimulators which gave electrical pulses of 1.3 to 2 Hz at nine volt amplitude. The amount of current was adjusted at each point so that the patient could tolerate the stimulation without discomfort. After twenty five minutes the needles were removed.

For patients with chronic pain, the initial course consisted of six treatments given every other day. Additional treatments were given only when patients reported definite relief. In patients with post-lumbar-puncture headaches, daily treatment was given to a maximum of three days.

A questionnaire was sent to each chronic pain patient six months after the therapy. Two hundred and sixty nine (84.6%) responded to the inquiry. The patients were asked: (1) to estimate how much of their pain was relieved, (2) whether they were taking less medicine for pain, and (3) their assessment of the treatment itself. The therapeutic effects were classified

*Mt. Sinai Hospital, Minneapolis.

TABLE

Nature of pain	Good (100-50% improved) Number cases	Percent	Fair (50-25%) Number cases	Percent	Poor (25-0%) Number cases	Percent	Total Number of cases
Headaches (Chronic)	23	58.9	5	12.8	11	28.2	39
Facial	4	36.4	3	27.2	4	36.4	11
Neck & Shoulder	17	63.0	3	11.1	7	25.9	27
Generalized Arthritis	21	51.2	7	17.1	13	31.7	41
Low Back Pain	35	44.3	14	17.7	30	38	79
Knees	13	72.2	3	16.7	2	11.1	18
Leg Pain	15	36.6	11	26.8	15	36.6	41
Herpes & M.S.	0	0	1	7.7 (M.S.)	12	92.3	13
Total	128	47.6	47	17.5	94	34.9	269

into three categories: Good, if pain relief was 50 percent or more, Fair, if it was between 25 and 50 percent, and Poor, if there was less than 25 percent or no relief of pain at all.

Results

The largest group of patients consisted of those suffering from low back pain. Most of them had undergone one or more operations. Other large groups consisted of patients with atypical headaches and arthritis of shoulders and knees (Table).

Of the 269 respondents, 128 (47.6%) reported good relief, 47 (17.5%) had fair relief, while 94 (34.9%) did not have significant improvement.

One hundred sixty-four patients (64.7%) reported they were taking less or no analgesics after the treatment. No patient felt that acupuncture had made the pain worse.

Thirty patients (11.2%) reported that the treatment was painful; all others found it tolerable. We did not encounter any complications.

Pain relief in head and neck pain was achieved with only two or three treatments in most of the responsive patients, and the duration of relief was longer compared to patients with other chronic pain problems.

Of the thirty post-lumbar-puncture headache patients, twenty-nine (96.7%) obtained complete and permanent relief. The mean number of treatments for these patients was 2.29 ± 1.36 SD.

Discussion

Sixty-five percent of our chronic pain patients reported good to fair relief six months after the acupuncture treatment. In most of these patients treatments such as surgery, medication, nerve blocks, physical therapies, percutaneous nerve stimulation, and psychiatric consultations had failed. Acupuncture has a special value where other methods have proven ineffective in treatment of chronic pain. It incurs practically no complications in our experience, while its effectiveness is comparable to other modes of stimulatory therapy.[2,3,4]

Our results are in agreement with those reported by Leung et al.,[5] who claimed that 68% of their patients had complete or partial improvement after acupuncture. It is also of interest to note that acupuncture seems to offer more therapeutic value in treatment of head and neck pain as shown by our series. This is in agreement with the reported observation that acupuncture works better as an anesthetic method in head and neck surgery.

Acupuncture, in our experience, was most successful in treating post-lumbar-puncture headaches. It offers a simple and effective approach to a distressing problem. Psychologically these patients were quite different from the chronic pain patients. They were not familiar with either the headache or the acupuncture treatment, both occurred unexpectedly during their short stay in the hospital. Their attitude towards acupuncture ranged from skepticism to bewilderment. These are the naive patients who should be relatively objective towards the treatment. Significant success in this group is less likely due to suggestion or placebo effect. Recently, opiate-like substance was discovered in the brain, and it was also found that the acupuncture analgesic effect could be reversed by naloxone.[6] These findings suggest that acupuncture has some neurophysiological functions which are yet to be defined.

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Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors



Editorials

Facial Spasm

In the short span of a decade, the surgical microscope has become an indispensable part of the neurosurgeon's equipment. It has played an important role in improving results of surgery for conditions such as acoustic neuroma, pituitary tumor surgery, whether transphenoidal or transfrontal, arteriovenous malformations, and cerebral aneurysms.

Janetta extended his pioneering microvascular decompression of the trigeminal nerve to the identification of vascular loops touching and/or compressing the facial nerve and implicated these arterial loops as one cause of hemifacial spasm.[1]

Drs. Erickson and Chou *report in this issue on the application of microvascular decompression of the facial nerve in a patient of theirs with hemifacial spasm. They clearly indicate that this is the preferred surgical treatment, far better than severing the facial nerve, or crushing it.

The selection of such a patient implied differentiation from other movement disorders of the face:

(1) Essential blepharospasm is easiest to differentiate in this group — it is bilateral, involving primarily the orbicularis muscles.

(2) Facial myokymia is a very rare undulating movement of muscles that may occur with fatigue, most frequently is benign, but has been reported with brain stem tumors. The movements are reportedly undulating, worm-like, not spasmodic.

(3) Habit spasm or "facial tic" may be the hardest to differentiate, particularly if it is unilateral. Walter Dandy[2] stated that a patient could talk undisturbed with facial tic, but with hemifacial spasm speech stopped during the attack.

Finally, evaluation should include skull X rays to identify dolichocephalic skulls and skulls with craniovertebral junction abnormalities. These abnormalities have been associated with distortions and malformations of the vertebral artery in conjunction with hemifacial spasm.[3] Vertebral angiography helps identify the arterial obstructions.

Drs. Erickson and Chou deserve congratulations for bringing to our attention a new and better treatment for an old, unpleasant problem.

John L. Seymour, M.D.
Minneapolis, Minnesota

*See page 421.

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Fresh Water

THE ENERGY CRISIS may seem pale in comparison to what is about to occur in the area of fresh water conservation, according to the year long investigation of the Minnesota Medical Association's Environmental Health Committee.

Contamination of our environment has reached epidemic proportion. We don't fully realize how damaging some of our actions are, but we are beginning to see that many of the activities of man are poisoning the land, water, and air of this planet.

We are severely jeopardizing the health of future generations, and unless we act now to bring about meaningful changes, the suffering and the health care costs of the future will be astronomical.

A great deal of the problem is centered around what we do with our waste materials. The term waste disposal really is a misnomer. We are camouflaging, storing, moving, or otherwise concealing our waste, but there is very little actual disposal occurring. The simple fact is that we cannot continue to find new holes to dump waste materials into. The materials are not staying where we place them, and the natural cleansing action of the earth is not geared to accommodate the tremendous volume of matter that is being poured into it; thus, we are contaminating our underground water supply at an increasing rate. And, much of our surface water is already unfit for human consumption.

Up to this point the answer has been to treat water with a chemical process. The destruction of bacteria through this process brought about one of the largest single advances in the pursuit of good health. This treated water eliminated the infectious disease agents that ravaged the world before that time.

While we have been successful in taking this major stride to cleanse water of bacteria, the process does not eliminate many viruses, and there is a whole new series of threats that have entered the picture thanks to the ingenuity of man — heavy metals and exotic chemicals. While many of these exciting scientific discoveries have brought favorable changes to our lifestyle, we are beginning to discover that many of them are mutagenic and carcinogenic. And, the existing water treatment systems do not remove these substances. Complicating the situation still further is the belief by some scientists that the very substance (chlorine) we are using to treat our drinking water is harmful to human health.

The biggest problem with these suspected harbingers of disease and distress is that they do not impart their deadly impact with the suddeness of a virus or bacteria, but creep up on their victims over a period of years. Studies of cancer in the asbestos industries, for instance, have shown that the destructive effects of the cancers may not appear for 20 years.

So, it becomes terribly difficult to convince a technology-crazed society that many of its luxuries today may serve as the method of their death years from now.

A major obstacle to cleansing the water that is so essential to all living things is the fear of economic disturbance. Before any realistic progress can be made toward cleansing the nation's water supply, the economics must be examined.

There will undoubtedly be substantive economic impact when and if the indiscriminate distribution of waste materials is altered, but the impact will not be entirely negative as many industrialists would have us believe. Positive action will result more in a relocation of economic resources.

That is to say, if we are to prevent pollution of waters rather than to attempt to cleanse contaminated waters, we may have to expend just as much money and to create just as many employment opportunities, but the spending and hiring patterns will be changed. (Recent studies show 20,318 jobs lost due to environmental changes since 1971 and 677,900 created as of 1974.)

Economically, the costs of not changing the current policy of pollution will be much more costly to industry than will be the price for preventing the pollution initially. Industries that are beginning to pay out tremendous court settlements for victims of their pollution can testify to the fact that pollution controls would have been far less expensive. Communities where tourism, fishing, and other industries tied to the environment have been destroyed can testify to the economic loss caused by pollution.

But, most of all we are just beginning to learn of the tremendous health costs that are being incurred because of our careless pollution activities.

Bearing in mind the simple fact that water is essential to all life on this planet, we must begin immediately to act to preserve this life supporting substance. It is not acceptable to merely kill some of

the contaminants and allow the water supply to continue to be filled with an increasing amount of foreign substances.

What is needed is a firm policy on clean water that requires prevention of pollution at the source of potential contamination. We need to put the emphasis on providing economic incentives to prevent pollution and make punishment a second choice. And, we need to totally reassess where and how we disperse our waste materials.

*Chairman of the MMA Environmental Health Committee. Former chairman of the Minnesota State Board of Health and an internist in private practice in St. Paul.

†Director of Communications for the MMA, and staff member with the Association's Environmental Health Committee.

Valentine O'Malley, M.D.*
Jim Kosmo†
St. Paul, Minnesota

Pulse Delay in Subclavian Steal (SSS)

IT IS CURIOUS that despite being a well-documented sign in SSS, relatively little in literature refers to pulse delay as a feature of the syndrome. Although easily perceived, it is more subtle than pulse and blood pressure differentials between both arms.

Because of the continuing proliferation of technological methods (e.g., Doppler technique), it is all too easy to neglect more basic tools of examination. It is refreshing to read a paper which reminds us of this.*

Waldemar F. Cruz, M.D.
Minneapolis, Minnesota

*Shapiro, S.K. et al.: Pulse Delay in Subclavian Steal. Minnesota Med 61:6:351, 1978.

Minnesota Society of Anesthesiologists

1978 Fall Scientific Meeting

Saturday, September 9, LaFrance Hotel, Junction Highways 100 & 494, Bloomington, Minnesota. For further information, contact: Dr. David Byer, Mayo Clinic, Rochester, Minnesota 55901.

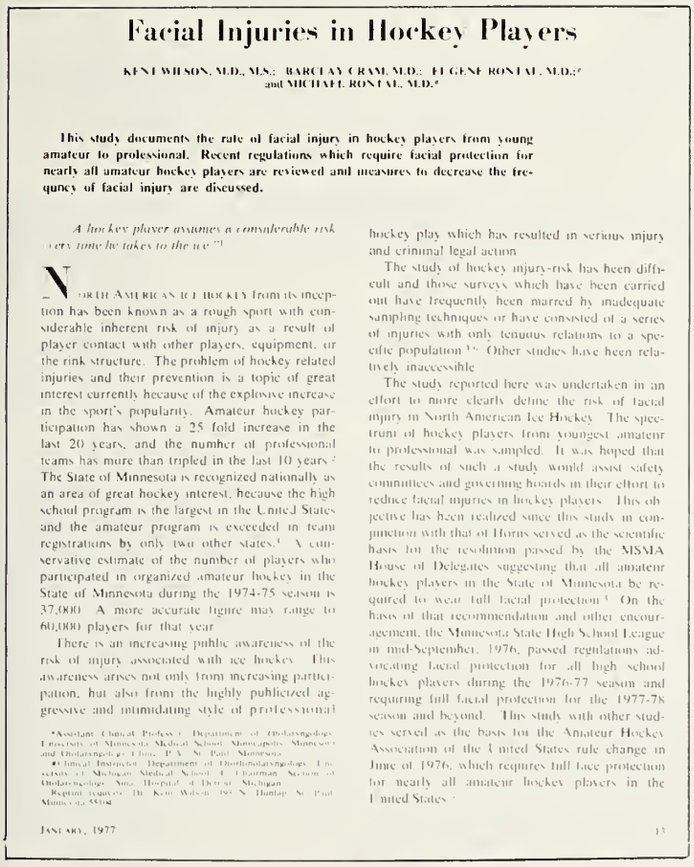
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MINNESOTA MEDICINE's Best of the Year

Each Spring the Board of Editors announces its choices for the best scientific/original article and best cover for the previous year. The winners for 1977 are:

Best Articles



Facial Injuries in Hockey Players

KENT WILSON, M.D., M.S.; BARCLAY CRAM, M.D.; EUGENE RONTAL, M.D.; and MICHAEL RONTAL, M.D.

This study documents the rate of facial injury in hockey players from young amateur to professional. Recent regulations which require facial protection for nearly all amateur hockey players are reviewed and measures to decrease the frequency of facial injury are discussed.

A hockey player assumes a considerable risk every time he takes to the ice.[1]

NORTH AMERICAN ICE HOCKEY from its inception has been known as a rough sport with considerable inherent risk of injury as a result of player contact with other players, equipment, or the rink structure. The problem of hockey related injuries and their prevention is a topic of great interest currently because of the explosive increase in the sport's popularity. Amateur hockey participation has shown a 25 fold increase in the last 20 years, and the number of professional teams has more than tripled in the last 10 years.[2] The State of Minnesota is recognized nationally as an area of great hockey interest, because the high school program is the largest in the United States and the amateur program is exceeded in team registrations by only two other states.[3] A conservative estimate of the number of players who participated in organized amateur hockey in the State of Minnesota during the 1974-75 season is 37,000. A more accurate figure may range to 60,000 players for that year.

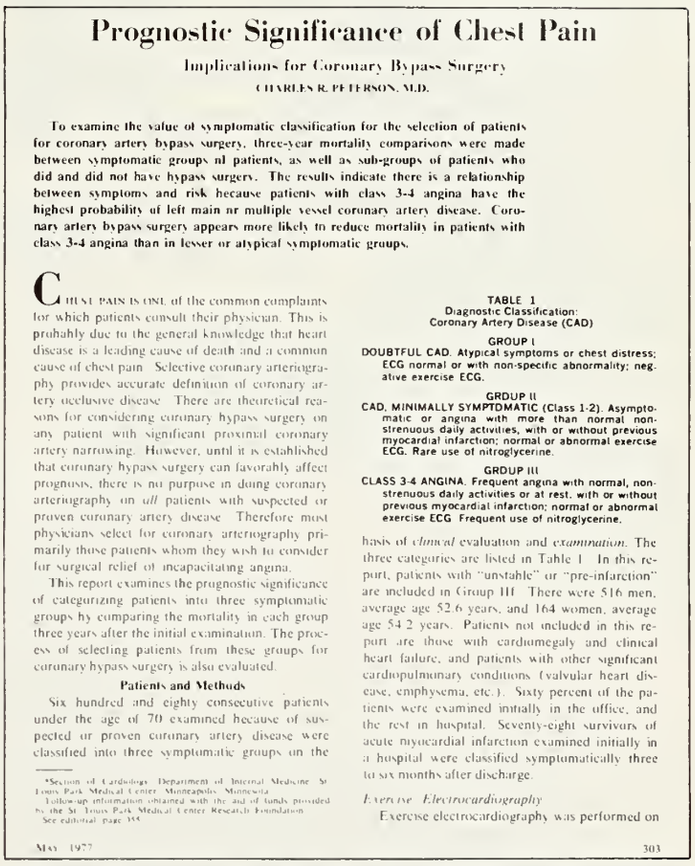
There is an increasing public awareness of the risk of injury associated with ice hockey. This awareness arises not only from increasing participation, but also from the highly publicized aggressive and intimidating style of professional hockey play which has resulted in serious injury and criminal legal action.

The study of hockey injury-risk has been difficult and those surveys which have been carried out have frequently been marred by inadequate sampling techniques or have consisted of a series of injuries with only tenuous relations to a specific population.[3-5] Other studies have been relatively inaccessible.

The study reported here was undertaken in an effort to more clearly define the risk of facial injury in North American Ice Hockey. The spectrum of hockey players from youngest amateur to professional was sampled. It was hoped that the results of such a study would assist safety committees and governing boards in their effort to reduce facial injuries in hockey players. This objective has been realized since this study in conjunction with that of Horns served as the scientific basis for the resolution passed by the MSMA House of Delegates suggesting that all amateur hockey players in the State of Minnesota be required to wear full facial protection.[6] On the basis of that recommendation and other encouragement, the Minnesota State High School League in mid-September, 1976, passed regulations advocating facial protection for all high school hockey players during the 1976-77 season and requiring full facial protection for the 1977-78 season and beyond. This study with other studies served as the basis for the Amateur Hockey Association of the United States rule change in June of 1976, which requires full face protection for nearly all amateur hockey players in the United States.[7]

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Reprint requests: Dr. Kent Wilson, 195 N. Dunlap St., St. Paul, Minnesota 55104.

"Facial Injuries in Hockey Players" by Kent Wilson, M.D. and Barclay Cram, M.D., St. Paul Otolaryngologists, and Eugene Rontal, M.D. and Michael Rontal, M.D., Otolaryngologists practicing in Detroit, Michigan. Published in January, 1977 issue of MINNESOTA MEDICINE.



Prognostic Significance of Chest Pain

Implications for Coronary Bypass Surgery

CHARLES R. PETERSON, M.D.

To examine the value of symptomatic classification for the selection of patients for coronary artery bypass surgery, three-year mortality comparisons were made between symptomatic groups of patients, as well as sub-groups of patients who did and did not have bypass surgery. The results indicate there is a relationship between symptoms and risk because patients with class 3-4 angina have the highest probability of left main or multiple vessel coronary artery disease. Coronary artery bypass surgery appears more likely to reduce mortality in patients with class 3-4 angina than in lesser or atypical symptomatic groups.

CHEST PAIN IS ONE of the common complaints for which patients consult their physician. This is probably due to the general knowledge that heart disease is a leading cause of death and a common cause of chest pain. Selective coronary arteriography provides accurate definition of coronary artery occlusive disease. There are theoretical reasons for considering coronary bypass surgery on any patient with significant proximal coronary artery narrowing. However, until it is established that coronary bypass surgery can favorably affect prognosis, there is no purpose in doing coronary arteriography on *all* patients with suspected or proven coronary artery disease. Therefore most physicians select for coronary arteriography primarily those patients whom they wish to consider for surgical relief of incapacitating angina.

This report examines the prognostic significance of categorizing patients into three symptomatic groups by comparing the mortality in each group three years after the initial examination. The process of selecting patients from these groups for coronary bypass surgery is also evaluated.

Patients and Methods

Six hundred and eighty consecutive patients under the age of 70 examined because of suspected or proven coronary artery disease were classified into three symptomatic groups on the basis of *clinical* evaluation and *examination*. The three categories are listed in Table 1. In this report, patients with "unstable" or "pre-infarction" are included in Group III. There were 516 men, average age 52.6 years, and 164 women, average age 54.2 years. Patients not included in this report are those with cardiomegaly and clinical heart failure, and patients with other significant cardiopulmonary conditions (valvular heart disease, emphysema, etc.). Sixty percent of the patients were examined initially in the office, and the rest in hospital. Seventy-eight survivors of acute myocardial infarction examined initially in a hospital were classified symptomatically three to six months after discharge.

TABLE 1
Diagnostic Classification:
Coronary Artery Disease (CAD)

GROUP I
DOUBTFUL CAD. Atypical symptoms or chest distress; ECG normal or with non-specific abnormality; negative exercise ECG.

GROUP II
CAD, MINIMALLY SYMPTOMATIC (Class 1-2). Asymptomatic or angina with more than normal non-strenuous daily activities, with or without previous myocardial infarction; normal or abnormal exercise ECG. Rare use of nitroglycerine.

GROUP III
CLASS 3-4 ANGINA. Frequent angina with normal, non-strenuous daily activities or at rest, with or without previous myocardial infarction; normal or abnormal exercise ECG. Frequent use of nitroglycerine.

Exercise Electrocardiography

Exercise electrocardiography was performed on

*Section of Cardiology, Department of Internal Medicine, St. Louis Park Medical Center, Minneapolis, Minnesota
Follow-up information obtained with the aid of funds provided by the St. Louis Park Medical Center Research Foundation.
See editorial page 355

"Prognostic Significance of Chest Pain — Implications for Coronary Bypass Surgery" by Charles R. Peterson, M.D., Minneapolis Cardiologist. Published in the May, 1977, issue of MINNESOTA MEDICINE.

Best Cover



"Rainbow at Machu Picchu, Peru", June, 1977, issue of MINNESOTA MEDICINE, by Harry W. Mixer, M.D., Minneapolis radiologist.

Rheumatology Corner

Aims of Diagnosis and Management of Patients with Arthritis

HARVINDER LUTHRA, M.D.*

MOST OF THE diseases affecting the musculoskeletal system are diseases of unknown etiology, and although few are curable, there are many aspects in which these patients can be helped. This realization on the part of the physician and the patient can lead to better patient care, and more satisfactory outcome.

Not all aches and pains in the joints necessarily imply arthritis. Bursitis, tendonitis, myositis, tension myalgias and arthralgias, local trauma, referred pain all may simulate arthritis to the casual observer. It is vital to obtain an adequate history of the details of the onset of symptoms, areas and pattern of involvement, and associated constitutional symptoms because this is helpful in separating the conditions. The history, a complete examination of the patient including the musculoskeletal system, and appropriate tests are often necessary to confirm the clinical impression.

The course of many articular diseases is unpredictable, and, except for such entities as gout or rheumatic fever, it is usually inappropriate to predict long-term outcome. Reasonable optimism on the part of the physician and appropriate recognition for the need of long term supervision should increase patient satisfaction and compliance.

In the management of patients with these diseases some of the goals are:

(a) Relieve pain, (b) Decrease or suppress inflammation, (c) Improve and maintain function, (d) Prevent irreversible damage, and (e) Repair damaged tissues.

Pain is one of the main symptoms which brings the patient to the physician. In the inflammatory arthritides, anti-inflammatory analgesics (e.g. aspirin) are preferrable to simple analgesics (e.g. acetaminophen). The introduction of agents which are apt to cause toxicity or long term side-effects must be done with great care in chronic states. Preserving function of the joint requires maintenance of range of motion and muscular strength. This can be fostered with appropriate physical therapy. Overuse of the joints increases inflammation while complete inactivity without physical therapy sets the stage for contractures and muscle atrophy. The proper balance between activity, and rest is ideal though it may be difficult to achieve.

It is not unusual for patients to seek medical attention when they already have advanced joint damage or for joint damage to occur in spite of good medical care. Reconstructive surgery has greatly improved in recent years and has helped many achieve painfree and useful motion.

Misuse of analgesics and ignoring measures aimed at maintaining adequate function is easy. However, seeing a patient able to lead a reasonably comfortable life, in spite of some pain and some functional limitation, is the best testimony that proper consideration and care of patients with arthritis or musculoskeletal symptoms can be beneficial to the patient and satisfying to the physician — the goal to be aimed for.

*Mayo Clinic, Rochester, Minnesota.


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Parenteral administration is not recommended in the presence of hypotensi tachycardia.

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Clinical Pharmacy

Clonazepam in the Treatment of Epilepsy

S. JAMES MATTHEWS, PHARM.D.,* STEVEN M. PEPIN, PHARM.D.,* and ILO E. LEPPIK, M.D.†

Clonazepam may aid in the control of seizures refractory to conventional treatment. This article reviews the literature dealing with the activity, pharmacokinetics, and usage of this relatively new anti-epileptic agent.

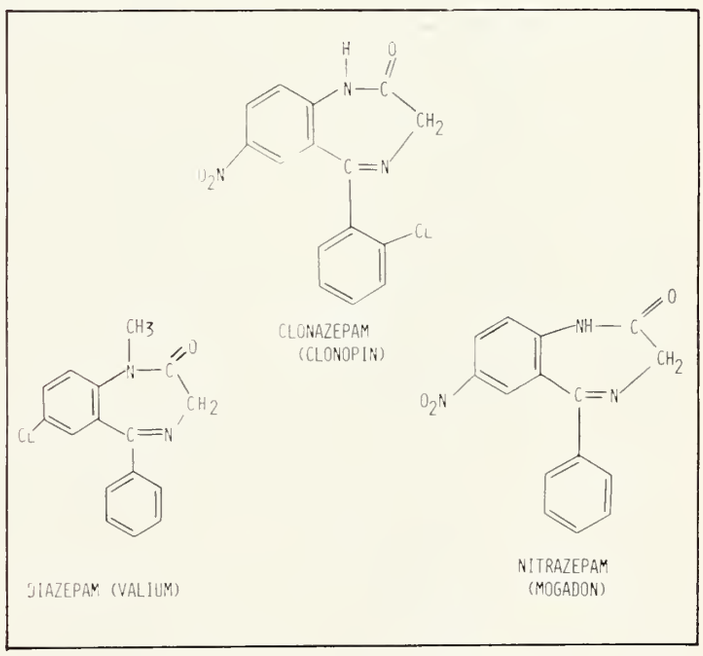
CLONAZEPAM IS A benzodiazepine which has been recently approved by the Food and Drug Administration (FDA) for the treatment of certain seizure disorders. The benzodiazepines are a large class of compounds which have well known anxiolytic, sedative and anticonvulsant properties and include drugs such as chlordiazepoxide (Librium®), flurazepam (Dalmane®), diazepam (Valium®), and nitrazepam (Mogadon®). Clonazepam is structurally most similar to nitrazepam, differing from it only by the presence of a Cl group at the 2 position of the phenyl group (Figure). The remarkable anti-epileptic properties of intravenous diazepam were first reported by Gastaut et al.,[1] and this drug has become widely used in the treatment of status epilepticus.[2] Intravenous clonazepam appears to be even more effective than diazepam in the treatment of this condition.[3] Although orally administered diazepam and nitrazepam have not been as useful as initially expected, clonazepam has been shown to be effective in the treatment of some types of seizures. [4,5]

This review is intended to provide an overview of the pharmacological and clinical information currently available regarding the use of clonazepam.

Pharmacokinetics

To be effective in the treatment of chronic disorders manifested by paroxysmal events, drugs must attain and maintain therapeutic concentrations at their site of action. Clonazepam is very lipid soluble,[6] and crosses biological membranes rapidly. Its quick entry into the central nervous system of humans is demonstrated by the short interval between intravenous administration and anti-epileptic action.[3,7] After oral administration, anti-epileptic effect has been observed to occur after 30 to 60 minutes with activity reported to persist for 6 to 12 hours.[3,5,8,9] The plasma half-life of clonazepam has been observed to range from 18 to 60 hours,[6,10,11,12] with a mean of 28.7 hours in children.[13] The discrepancy between the relatively short duration of effect and long plasma half-life may be attributable to a redistribution of this highly lipid soluble drug from an organ of high perfusion, the brain, to less well perfused tissue, a phenomenon well documented for lipid soluble drugs such as thiopental.[14] Clonazepam distributes to many other tissues than brain, with high concentrations found in liver, intestine, and choroid layer and ciliary body of the eye of experimental animals. Clonazepam crosses the placenta readily and large amounts of this drug may accumulate in the fetus.[15]

Less than 1% of a dose of clonazepam is excreted unchanged in the urine in 24 hours.[6,16] The major route of elimination is by hepatic metabolism with reduction to 7-aminoclonazepam and acetylation to 7-acetylaminoclonazepam.



Figure—Structures of benzodiazepines with antiepileptic properties.

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This work was supported in part by NINDS Contract #NO1-NS-5-2327 and the MEARF of St. Paul-Ramsey Hospital

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Mechanism of Action

The role of inhibitory neurotransmitters has been recently elucidated.[17] Gamma amino butyric acid (GABA) is well established inhibitory transmitter in the central nervous system and decreased levels of this key substance resulting from pyridoxine deficiency have been linked to the occurrence of generalized seizures (pyridoxine responsive epilepsy).[18] Benzodiazepines antagonize seizures elicited by GABA receptor blocking agents, such as picrotoxin and bicuculline, and may act by mobilizing GABA from storage sites.[19] Other workers suggest that benzodiazepines may mimick the actions of glycine, an inhibitory transmitter in the brain stem and spinal cord.[17,20] Chadwick et al. have suggested that the possible protective effect of clonazepam in myoclonic seizures may be due to its ability to increase brain serotonin concentrations.[21,22] Thus, although the exact mechanism of action is not known, these drugs appear to modulate inhibitory transmission, thereby reducing the excitability of the central nervous system.

Electroencephalographic studies have shown an ability of clonazepam to suppress generalized abnormalities while allowing focal abnormalities to remain.[2,23] In humans, the drug decreases the frequency, amplitude, duration and spread of discharge in seizures,[30] and is capable of suppressing the spike and wave discharges in absence seizures. Clonazepam also produces an excess of low voltage fast (beta) activity which is most prominent in anterior regions but may spread posteriorly.[2,9,23]

Clinical Effectiveness

Clonazepam is most impressive in the treatment of patients with myoclonic seizures, with patients obtaining good to excellent seizure control (Table). However, since this type of seizure is relatively uncommon, these conclusions are drawn from a small population. Patients with simple absence (petit mal) seizures and the Lennox-Gastaut syndrome often respond to clonazepam even if their seizures were refractory to more traditional forms of therapy.[4,24,25,26,27,28,29]

Several investigators have noted a beneficial effect from concurrent administration of clonazepam and ACTH in the treatment of infantile spasms.[4,29] Therapeutic effects may be seen in these patients within one to two weeks using clonazepam alone.[6] The results of clonazepam in the control of myoclonic, akinetic, atypical petit mal and infantile spasm is encouraging because these seizures are often refractory to conventional therapy.[4,5,9,26,29,30,31]

Clinical trials in Europe have shown clonazepam to be effective in the treatment of generalized tonic-clonic (grand mal), partial complex (psychomotor, temporal lobe) or focal (Jacksonian) seizures.[5,8,9,31,32,33,34,35]

TABLE

Summary of Clinical Trials with Clonazepam.

Seizure Type	Number of Studies	Total Patients	Seizure Control* Excellent	Good	Poor
Myoclonic	6 (a)	19	68%	32%	0
Simple Absence (Petit Mal)	9(b)	60	73%	2%	25%
Lennox-Gastaut	5(c)	86	50%	22%	28%
Infantile Spasm	6(d)	72	21%	35%	44%
Akinetic	3(e)	24	38%	46%	16%
Atypical Absence	3(f)	34	44%	41%	15%
Generalized Tonic-Clonic	7(g)	85	35%	17%	48%
Partial Complex (Temporal Lobe, Psychomotor)	9(h)	122	39%	21%	40%

*Excellent = 75-100% Reduction in Seizures
Good = 50-75% Reduction
Poor = Less Than 50% Reduction, No Change or Increased Frequency

(a) 5,9,24,26,27,30
(b) 4,8,9,20,27,28,30,33,35
(c) 4,25,26,27,28
(d) 4,5,9,25,26,30
(e) 5,9,30
(f) 5,27,30
(g) 4,24,26,27,30,35,39
(h) 4,9,24,26,27,30,35,39,56

Clonazepam may be a valuable addition to the therapy of patients with a mixed seizure disorder, as control is often difficult to achieve with other anti-epileptic medications. Use of clonazepam under these circumstances may result in suppression of one seizure type, while other forms may remain unaffected or be increased.[24,34]

Blood Levels

A number of techniques for measuring plasma clonazepam concentrations are available. Most require an electron capture gas liquid chromatograph, due to the small amount of drug present in the specimen.[6,10,13,16] One method requiring small capillary tube samples and suitable for use in infants and children has been described.[36] A radioimmunoassay is also available.[37] In a double blind study, Dreifuss et al.[13] reported a therapeutic range of 13 to 72 ng/ml* in children with simple absence seizures (petit mal). Effective levels of 15 to 50 ng/ml have been reported to be adequate for control of myoclonic seizures.[38] However, Huang et al. found good control of focal epilepsia partialis continua, myoclonic seizures, or self-induced photogenic seizures with plasma levels of 20 ng/ml or lower, but found plasma levels of 25-30 ng/ml to be effective for control of generalized tonic-clonic and partial complex (temporal lobe) seizures.[24]

Toxicity

Side effects of drowsiness, ataxia, and behavioral changes are frequent with clonazepam. Drowsiness, reported by approximately half of all patients, and ataxia, in one-third, usually occur upon initiation of treatment but tolerance to these effects may develop in one to two weeks.[5,8,28,33] Drowsiness and ataxia may be reduced by decreasing the dosage or slowing the rate of increase. However, in some patients these may be so severe as to lead to the discontinuation of clonazepam.[4,16,28,33,39] An association between plasma levels and side effects has not been clearly established.[16,39,40]

Behavioral changes of increased irritability, aggressiveness, agitation and hyperkinesis, similar to those seen with barbiturates, may occur in 25 per cent of children receiving clonazepam.[4,5,27,32,34,41] In contrast, behavior of some patients may improve.[30,34] Although dextroamphetamine and methylphenidate (Ritalin®) have been used to counteract the lethargy, irritability, belligerence, and hyperactivity associated with clonazepam,[5,9,30] respiratory depression has occurred with this combination.[30]

In some severely retarded patients treated with clonazepam, the adverse effects of the drug may decrease the patient's ability to function and thus outweigh the benefits of fewer seizures. Exacerbation of pre-existing seizures or the appearance of new seizure types such as generalized tonic-clonic (grand mal)[5,8,26,27,33,34,39] or drop attacks, occurs in about 10 per cent of patients,[42] and may necessitate discontinuation of therapy with this drug. Nystagmus, slurred speech, dysarthria, increased appetite, anorexia, abnormal elevations of liver enzymes (serum alkaline phosphatase and SGPT[29]) and, rarely, blood dyscrasias have been reported.[4,5,26,30,43] Mucous obstruction, sialorrhea, and increased bronchial secretions are some of the most troublesome side effects occurring in infants and young children.[4,29]

Fatal overdoses are an ever present danger with drugs, although benzodiazepines may have a greater margin of safety than other medications.[2,44] An ingestion of 60 mg clonazepam by a 30-month-old child resulted in marked drowsiness and ataxia, but no circulatory or respiratory collapse. Treatment with gastric lavage resulted in recovery with no sequelae.[34]

Ingestion of minor tranquilizers during pregnancy has been associated with an increased risk of congenital anomalies,[45,46,47] but the risk for chlordiazepoxide may be low.[48] Since data is not available for clonazepam, its use during pregnancy must be considered only when the clinical situation warrants the risk.

Tolerance to the therapeutic effect of clonazepam has been noted in up to 30 per cent of patients and may occur within eight months after initiation of therapy. Control may be regained by increasing the dose of clonazepam.[26] However, an increase in dose does not always result in control of seizures, and disagreeable side effects may preclude such an adjustment.[26,29] This tolerance may be the result of a self-induction of metabolism, as has been suggested for diazepam.[50] However, lack of compliance, alteration of seizure threshold, and other factors must also be considered.

Drug interactions have been observed. Phenytoin (diphenylhydantoin) levels may increase with the addition of clonazepam or other benzodiazepines.[24,51,52] On the other hand, clonazepam levels may decrease after the addition of phenytoin.[16] Although this area requires further clarification, the possibility of alterations in plasma levels of other medications must be considered whenever a patient receives more than one drug.

*ng = nanogram = 10^{-9} gm

Dosing

Only the oral dosage form of clonazepam is available in the United States. It has been approved by the FDA for simple absence (petit mal), the Lennox-Gastaut syndrome (atypical absence), infantile spasms and myoclonic seizures. Although used in Europe for generalized tonic-clonic, partial complex and focal seizures, approval in this country is awaiting results of further studies of efficacy. Clonazepam is presently marked as Clonopin® by Roche (in Europe, Rivotril®) and is supplied as scored tablets of 0.5 mg (orange), 1.0 mg (blue), and 2 mg (white). A liquid preparation is being developed. The recommended initial dose for infants and children (to 10 years of age) is 0.01 to 0.03 mg/kg/day. The dose should be increased by 0.25 to 0.50 mg every third day until seizures are controlled, toxicity intervenes, or a dose of 0.2 mg/kg has been reached. The initial dose in adults is 1.5 mg/day, with increases of 1 mg every third day to a maximum of 20 mg/day.

Addition of clonazepam to existing regimens may result in an increase of depressant effects, especially when clonazepam is added to therapy which includes phenobarbital or primidone.[4,26,35,53] When clonazepam is to be discontinued, it should be tapered, as rapid drug withdrawal may lead to an exacerbation of seizures or an abstinence syndrome characterized by dysphoria, irritability, restlessness, sleeplessness and tremor of the hands. These symptoms may clear with the use of small doses of clonazepam.[2,19,54,55,16]

Summary

Clonazepam, a recently approved anti-epileptic drug, may reduce the number of seizures in patients with simple absence (petit mal), atypical absence, myoclonic seizures or infantile spasm. Drowsiness, ataxia, and behavioral problems are the most frequently encountered adverse effects. Tolerance to these side effects as well as to the anticonvulsant properties of clonazepam occurs frequently. As effective blood levels are sought, close medical supervision and small adjustments in the dose of clonazepam are necessary to avoid adverse reactions.

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Q and A — CME

Questions from Minnesota Physicians Concerning Continuing Medical Education may be Addressed to:

MMA Committee on Medical Education
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101 East 5th Street
St. Paul, MN 55101

Those answered in MINNESOTA MEDICINE are the most common or the most appropriate to a specific time. Queries from individuals will be answered as rapidly as possible only if a self-addressed stamped envelope is enclosed.

Question:

How do I list credits for Audio Digest? My personal medical reading?

Answer:

For the AMA-PRA and the Board of Medical Examiners report this activity should be listed under Category 5 "individual CME activities" or "self instruction". The professional sponsoring organization is to be indicated. Please remember there are definite credit hour limitations in this category. Individual reading (self instruction) is also listed under Category 5.

Question:

Where can I get more information about the AMA-PRA?

Answer:

An instruction/information booklet and an application form may be procured from the AMA Department of Physician Credentials and Qualifications. Minnesota physicians should be aware that a new booklet is scheduled for release in August or September of 1978.

Q. When am I to report my CME to the Minnesota authorities?

*A. The Board of Medical Examiners does not require a report from the first group of physicians (1/3 of licensees-birth dates January through April) until January **1979.** At that time a report of 50 hours of CME is required for licensure reregistration. The other two groups need not report until **1980** and **1981**. **Do not** send in your CME report until you are asked for it as a part of the annual reregistration procedure.*

Incidentally, you should remember that Minnesota Medical Association no longer requires demonstration of CME as a partial requirement for membership.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

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cef' may be given either IM or IV at the same dosage schedule.

st infections can be treated with 500 mg. to 1 gram every 8 hours.

complete prescribing information in *PDR* or SK&F literature for full dosage instructions.)

ell Tolerated

equent phlebitis; no nephrotoxicity reported. Transient rises
BUN, SGOT, SGPT and alkaline phosphatase have been reported
hout clinical evidence of renal or hepatic impairment.

re prescribing, see complete prescribing information in SK&F ature or *PDR*. The following is a brief summary.

ations: Ancef® (sterile cefazolin sodium, SK&F) is indicated in the treatment following serious infections due to susceptible organisms.

iratory tract infections due to *Streptococcus (Diplococcus) pneumoniae*, *iella* species, *Hemophilus influenzae*, *Staphylococcus aureus* (penicillin-tive and penicillin-resistant), and group A beta-hemolytic streptococci.

lable benzathine penicillin is considered to be the drug of choice in the treat- and prevention of streptococcal infections, including the prophylaxis of rheu- fever.

ef' is effective in the eradication of streptococci from the nasopharynx; ever, data establishing the efficacy of 'Ancef' in the subsequent prevention eumatic fever are not available at present.

ltourinary tract infections due to *Escherichia coli*, *Proteus mirabilis*, *Kleb-* species, and some strains of enterobacter and enterococci.

and soft-tissue infections due to *S. aureus* (penicillin-sensitive and illin-resistant) and group A beta-hemolytic streptococci and other strains reptococci.

and joint infections due to *S. aureus*.

icemia due to *Str. pneumoniae*, *S. aureus* (penicillin-sensitive and penicillin-tant), *P. mirabilis*, *E. coli*, and *Klebsiella* species.

ocarditis due to *S. aureus* (penicillin-sensitive and penicillin-resistant) and p A beta-hemolytic streptococci.

opriate culture and susceptibility studies should be performed to determine eptibility of the causative organism to 'Ancef'.

traindications: 'Ancef' is contraindicated in patients with known allergy to ephalosporin group of antibiotics.

nings: BEFORE CEFAZOLIN THERAPY IS INSTITUTED, CAREFUL INQUIRY ULD BE MADE CONCERNING PREVIOUS HYPERSENSITIVITY REACTIONS CEPHALOSPORINS AND PENICILLIN. CEPHALOSPORIN C DERIVATIVES SHOULD BE GIVEN CAUTIOUSLY TO PENICILLIN-SENSITIVE PATIENTS.

SERIOUS ACUTE HYPERSENSITIVITY REACTIONS MAY REQUIRE EPINEPHRINE AND OTHER EMERGENCY MEASURES.

There is some clinical and laboratory evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both drugs.

Antibiotics, including 'Ancef', should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Usage in Pregnancy—Safety of this product for use during pregnancy has not been established.

Usage in Infants—Safety for use in prematures and infants under one month of age has not been established.

Precautions: Prolonged use of 'Ancef' may result in the overgrowth of non-susceptible organisms. Careful clinical observation of the patient is essential.

When 'Ancef' is administered to adults or children with low urinary output because of impaired renal function, lower daily dosage is required (see dosage instructions in the package literature).

A false-positive reaction for glucose in the urine may occur with Clinitest® tablets; use glucose enzyme-type reagents.

Adverse Reactions: The following reactions have been reported: Drug fever, skin rash, vulvar pruritus, eosinophilia, neutropenia, leukopenia, thrombocythemia, and positive direct and indirect Coombs tests have occurred. Transient rise in SGOT, SGPT, BUN, and alkaline phosphatase levels has been observed without clinical evidence of renal or hepatic impairment. Nausea, anorexia, vomiting, diarrhea, and oral candidiasis (oral thrush) have been reported. Pain at the site of injection after intramuscular administration has occurred, some with induration. Phlebitis at the site of injection has been noted. Other reactions have included genital and anal pruritus, genital moniliasis, and vaginitis.

Administration and Dosage: 'Ancef' may be administered intramuscularly or intravenously after reconstitution. See the package literature for reconstitution procedures.

See the package literature for dosage recommendations.

How Supplied: 'Ancef' (sterile cefazolin sodium, SK&F)—supplied in vials equivalent to 250 mg., 500 mg. or 1 gram of cefazolin; in "Piggyback" Vials for intravenous admixture equivalent to 500 mg. or 1 gram of cefazolin; and in Pharmacy Bulk Vials equivalent to 5 grams or 10 grams of cefazolin.

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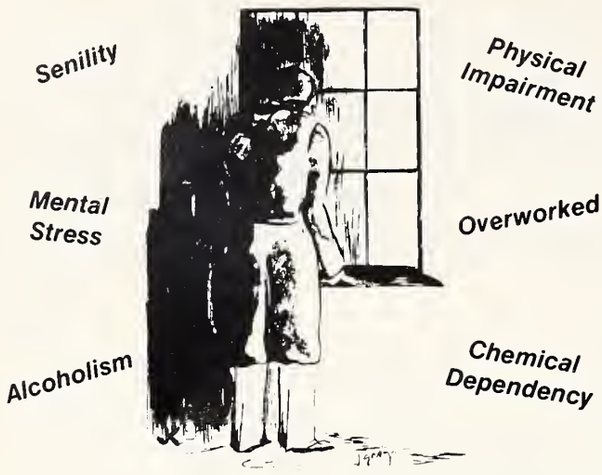
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Brief Summary of Prescribing Information
Combined TEGOPEN® (cloxacillin sodium)
Capsules and Oral Solution
For complete information, consult Official Package Circular. (12) TEGOPEN 9/11/75

Indications: Although the principal indication for cloxacillin sodium is in the treatment of infections due to penicillinase-producing staphylococci, it may be used to initiate therapy in such patients in whom a staphylococcal infection is suspected. (See Important Note below.)

Bacteriologic studies to determine the causative organisms and their sensitivity to cloxacillin sodium should be performed.

Important Note: When it is judged necessary that treatment be initiated before definitive culture and sensitivity results are known, the choice of cloxacillin sodium should take into consideration the fact that it has been shown to be effective only in the treatment of infections caused by pneumococci, Group A beta-hemolytic streptococci, and penicillin G-resistant and penicillin G-sensitive staphylococci. If the bacteriology report later indicates the infection is due to an organism other than a penicillin G-resistant staphylococcus sensitive to cloxacillin sodium, the physician is advised to continue therapy with a drug other than cloxacillin sodium or any other penicillinase-resistant semi-synthetic penicillin.

Recent studies have reported that the percentage of staphylococcal isolates resistant to penicillin G outside the hospital is increasing, approximating the high percentage of resistant staphylococcal isolates found in the hospital. For this reason, it is recommended that a penicillinase-resistant penicillin be used as initial therapy for any suspected staphylococcal infection until culture and sensitivity results are known.

Cloxacillin sodium is a compound that acts through a mechanism similar to that of methicillin against penicillin G-resistant staphylococci. Strains of staphylococci resistant to methicillin have existed in nature and it is known that the number of these strains reported has been increasing. Such strains of staphylococci have been capable of producing serious disease, in some instances resulting in fatality. Because of this, there is concern that widespread use of the penicillinase-resistant penicillins may result in the appearance of an increasing number of staphylococcal strains which are resistant to these penicillins.

Methicillin-resistant strains are almost always resistant to all other penicillinase-resistant penicillins (cross-resistance with cephalosporin derivatives also occurs frequently). Resistance to any penicillinase-resistant penicillin should be interpreted as evidence of clinical resistance to all, in spite of the fact that minor variations in *in vitro* sensitivity may be encountered when more than one penicillinase-resistant penicillin is tested against the same strain of staphylococcus.

Contraindications: A history of a previous hypersensitivity reaction to any of the penicillins is a contraindication.

Warning: Serious and occasionally fatal hypersensitivity (anaphylactoid) reactions have been reported in patients on penicillin therapy. Although anaphylaxis is more frequent following parenteral therapy it has occurred in patients on oral penicillins. These reactions are more apt to occur in individuals with a history of sensitivity to multiple allergens.

There have been well documented reports of individuals with a history of penicillin hypersensitivity reactions who have experienced severe hypersensitivity reactions when treated with a cephalosporin. Before therapy with a penicillin, careful inquiry should be made concerning previous hypersensitivity reactions to penicillins, cephalosporins, and other allergens. If an allergic reaction occurs, the drug should be discontinued and the patient treated with the usual agents, e.g., pressor amines, antihistamines, and corticosteroids.

Safety for use in pregnancy has not been established.

Precautions: The possibility of the occurrence of superinfections with mycotic organisms or other pathogens should be kept in mind when using this compound, as with other antibiotics. If superinfection occurs during therapy, appropriate measures should be taken.

As with any potent drug, periodic assessment of organ system function, including renal, hepatic, and hematopoietic, should be made during long-term therapy.

Adverse Reactions: Gastrointestinal disturbances, such as nausea, epigastric discomfort, flatulence, and loose stools, have been noted by some patients. Mildly elevated SGOT levels (less than 100 units) have been reported in a few patients for whom pretherapeutic determinations were not made. Skin rashes and allergic symptoms, including wheezing and sneezing, have occasionally been encountered. Eosinophilia, with or without overt allergic manifestations, has been noted in some patients during therapy.

Usual Dosage: Adults: 250 mg. q.6h.

Children: 50 mg./Kg./day in equally divided doses q.6h. Children weighing more than 20 Kg. should be given the adult dose. Administer on empty stomach for maximum absorption.

N.B.: INFECTIONS CAUSED BY GROUP A BETA-HEMOLYTIC STREPTOCOCCI SHOULD BE TREATED FOR AT LEAST 10 DAYS TO HELP PREVENT THE OCCURRENCE OF ACUTE RHEUMATIC FEVER OR ACUTE GLOMERULONEPHRITIS.

Supplied: Capsules—250 mg. in bottles of 100, 500 mg. in bottles of 100. Oral Solution—125 mg./5 ml. in 100 ml. and 200 ml. bottles.

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N THE MINNEAPOLIS AREA, STAPH RESISTANCE HAS NOW REACHED 81%.*

istance to penicillin G among community-acquired ph infections. Data on file, Bristol Laboratories.

WHEN YOU CAN'T RULE OUT STAPH, CONSIDER

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(cloxacillin sodium)

"THE PENICILLIN OF TODAY"

Effective against nonpenicillinase-producing staphylococci, beta-hemolytic streptococci, and pneumococci.†

†NOTE: The choice of Tegopen should take into consideration the fact that it has been shown to be effective only in the treatment of infections caused by pneumococci, Group A beta-hemolytic streptococci, and penicillin G-resistant and penicillin G-sensitive staphylococci. If the bacteriology report later indicates that the infection is due to an organism other than a penicillin G-resistant staphylococcus sensitive to cloxacillin sodium, the physician is advised to continue therapy with a drug other than cloxacillin sodium or any other penicillinase-resistant semisynthetic penicillin. The clinical significance of *in vitro* data is unknown.

10 times more active against strep than staph.

Well absorbed from the G.I. tract.‡

‡Maximum absorption occurs when Tegopen is taken on an empty stomach, preferably 1-2 hrs. before meals.



Please see brief summary for prescribing information.



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Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 101 East 5th, Suite 900, St. Paul, Minn. 55101.

FAMILY PRACTICE group in south metro suburban area wishes to expand to four family physicians. Interested physicians must be board certified or board eligible in family practice. Send inquiries or call Drs. Murray Hunter or Joseph Emond, River's Edge Medical Clinic, 310 Division Street, Farmington, Minnesota, 55024. 612-463-7181, Descriptive brochure available upon request.

PRIMARY CARE PHYSICIANS desired to join a 2 physician practice in two community based clinics in Central Minnesota. 80 minutes from the metropolitan area. Salary 35-43,000 depending on qualifications. For further information contact James Lawson, Cold Spring Medical Clinic — 26 N. Red River Ave. Cold Spring, MN 56320.

OB-GYN, ANESTHESIOLOGIST and Orthopedic Surgeon to join progressive incorporated seven man group in Central Minnesota. 120 bed hospital. Lake area. Excellent leisure activities. Starting salary $40,000 per year. Contact Personnel Director, Little Falls Clinic, Little Falls, Minnesota. Telephone 612/632-3611.

THE FARIBAULT CLINIC, Ltd., has an opening for a Family Physician. The Clinic is in a rural community near the Metropolitan area and has seven Family Physicians, two Surgeons and two Internists. The Clinic has just completed a remodeling and expansion program. For more information please write to: Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021.

CARDIOLOGY, OPHTHALMOLOGY and ENT specialty positions available with Mankato Clinic, Ltd. This multi-specialty group attracts specialty referrals from a Southern Minnesota area of 250,000 population. Excellent group practice opportunity in All American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year, incentive pay thereafter. For more information call collect Dr. C. H. Brady or Dr. B. C. McGregor, 507-625-1811.

PHYSICIANS AVAILABLE — Pediatrics (Minn.), Cardiology (T/C or Minn.), General Surgery (Minn.), Psychiatry (T/C), Internal Medicine — Oncology (T/C), OB-Gyn (T/C), Pathology (Minn.), Family Practice (T/C), Urology (Minn.) Family Practice (Minn.-Wisc.) Radiology (Minn.). This is a sampling of physicians seeking opportunities through the services of Metropolitan Medical Placement. If you are interested in adding an additional staff member, please contact Mr. Holmes at (612) 831-5232.

GENERAL PRACTITIONER to join MD in new Clinic in community of 2200; 25 miles southwest of Minneapolis; excellent schools and churches; productive farming area; 10-minute drive to hospital. Write or call Paul A. Stahler, M.D., Amo Vitae Clinic, 310 Sunset Drive, Jordan, MN 55352, 612-492-6323.

APPLICATIONS WELCOMED from board-qualified or certified radiologists, large teaching hospital, upper Midwest; university affiliation, subspecialty training in pediatrics and/or therapy desirable. Box 529, MINNESOTA MEDICINE, 101 E. 5th St., St. Paul 55101.

PHYSICIANS — Metropolitan Medical Placement offers assistance through our no obligation to the physician placement service. We always have several active listings throughout Minnesota and we specialize in *aggressively* seeking our opportunities to match each physician's individual needs. If you desire confidentiality and professionalism in our search efforts, then we ask you to please contact Mr. Holmes at 612-831-5232.

FAMILY PHYSICIAN needed to join a three man family practice. This is an interesting practice, with much of clientele from Northeast and Southeast Minneapolis. Good working relationships and adequate time off. Close to the University of Minnesota, downtown, and several hospitals. Contact St. Anthony Falls Clinic, Drs. Hall, Friend, or Mindrum, at 23 N. E. 4th St., Minneapolis, MN 55413. Telephone: (612) 379-2116.

(Continued to page 450)

(Continued from page 449)

PSYCHIATRIC RESIDENCY: vacancies for PG2 through PG4 only) positions starting July 1, September 1, 1978 and January 1, 1979 for those who have a regular Iowa license or can obtain one by reciprocity or via FLEX. Prepare for career in private practice, community clinics or hospital based psychotherapy, OPD, Children's Unit, Adolescent Unit. Neurology affiliation with University of Iowa. The stipends are: 1st year, $22,360; 2nd year, $23,478; 3rd year, $24,674. Intensity and diversity of training program appreciated best by personal visit. T. B. McManus, M.D., Superintendent, Mental Health Institute, Cherokee, Iowa 51012. Equal Opportunity Employer. Call collect 712-225-2594.

NORTH DAKOTA — CARDIOLOGIST: An opening is now available in Bismarck, North Dakota for an Invasive Cardiologist to practice with a SDA cardiovascular Surgeon. Phone 878-4606 (702).

FAMILY PRACTITIONER to serve as Associate Medical Director for new Group Health Plan Clinic in mid-sized central Minnesota community. Salary negotiable, comprehensive fringe benefits. Contact: John W. Harkness, M.D., 2500 Como Avenue, St. Paul, Minnesota 55108.

FAMILY PRACTITIONERS needed immediately to join present three physician corporate group practice in rural Southwestern Minnesota; guaranteed income with liberal fringe benefits; full partnership after one year; no investment necessary; new clinic facility attached to newly renovated hospital; area offers excellent recreational activities; top school systems; warm community atmosphere. Contact J.L. Bader, MD Chief of Staff, Slayton Clinic, 2744 Broadway Avenue, Slayton, Minnesota 56172; Phone number: (507) 836-6153 or 836-6463.

LOCUM TENENS POSITION: General practice opportunity in St. Paul multispecialty clinic. No call or in-patients. Guaranteed salary. Contact: J. W. Harkness, M.D., Group Health Plan, 2500 Como, St. Paul, Minn. 612-646-9461.

RICHFIELD PROFESSIONAL OFFICE SPACE. Excellent location in Hub Center, 1500 square feet. Fully air conditioned. Immediate occupancy. Call Gaylord Ryg, Multivest, 566-0300 (Home 929-4944).

FOR LEASE OR SALE: Medical building for three generalists or four specialists. Area growing; Big Mt. ski area; lake, near Glacier Park; (406) 862-2816 or W. N. McIntyre, Rt. 1, Whitefish, Mt.,

FIFTEEN MAN MULTI/SPECIALTY group needs two family practice and two OB/GYN and one man in the following departments; ENT and orthopedic surgery. Located in Northwest Minnesota's beautiful unspoiled lake and woods country. Contact J. R. Parkin, M.D., Bemidji Clinic, Ltd., Bemidji, MN 55601.

FOR SALE: Burdick CS 515 Monitor, with stand, excellent condition. Perfect for Doctor's office, exercise testing, or Hospital OR use. Contact: R. L. Thienes, M.D.; Box 1161, St. Cloud, Minnesota, 56301.

FAMILY PRACTICE PHYSICIAN: To Join: 7 man Family Practice Group. Complete call system, new clinic (10,000 sq. ft.). New accredited 65 bed hospital and adjacent 100 bed nursing home. Serves area of 10 to 12,000 people in active stable community. Located in the heart of northern recreational area. Contact F. H. Walter, M.D. or George M. Crow, M.D. at the Falls Medical Center, P.A., Box 791, Shorewood Drive, International Falls, Minnesota 56649; Telephone: (218) 283-9431.

PSYCHIATRIST WANTED, Board eligible, for staff of Hamm Memorial Psychiatric Clinic. Caseload is predominately older adolescents and young adults. Duties include outpatient psychotherapy with individuals, couples and groups, consultation to staff social workers and psychologists, and to colleges and schools in area. Salary negotiable. Generous fringe benefits. Apply in writing (include resume) to Dr. R. P. Bush, 919 B Lafond Ave., St. Paul, Mn. 55104. Equal Opportunity Employer.

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NET LEASE CLINIC BUILDINGS: Would like to build and net leaseback a clinic building (any size — your plans) for physicians and dentists in Maplewood, North Ramsey County, adjacent to Maplewood Mall Shopping Center off I-694 on 66 acres fronting on four-lane Beam Avenue west of the mall. Call Attorney-Owner William Korstad, 612-339-3100.

GENERAL INTERNIST to associate with large Department of Internal Medicine in growing multispecialty group with seven clinics in the metropolitan area. Competitive compensation and liberal fringe benefits offered. Curriculum vitae invited: John W. Harkness, M.D., 2500 Como Avenue, St. Paul, Minnesota 55108.

Pregnancy Termination

An Abortion Perspective
Medical Considerations

FRED A. LYON, M.D., F.A.C.O.G.*

THE MEDICAL ASPECTS of abortion, from the viewpoint of the physician responsible for performing this medical procedure, are best considered when divided into three categories: preprocedure, intraprocedure and postprocedure. These categories can then be subdivided into more specific areas of medical concern. The following discussion is not intended to be all-inclusive; there are several other considerations which could well be discussed.

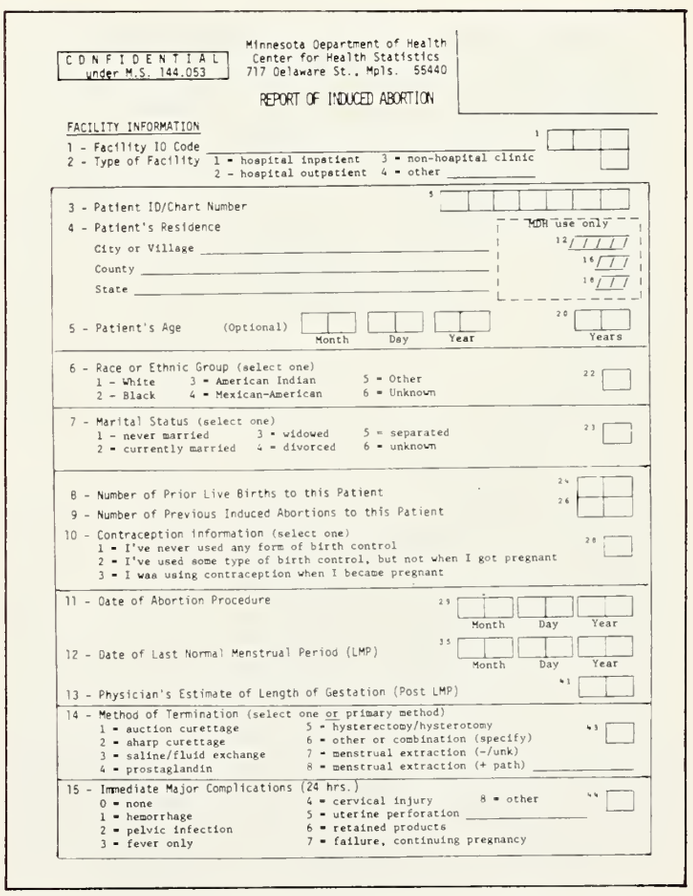
The material presented here reflects the medical care given to patients presenting themselves for pregnancy termination at the Meadowbrook Women's Clinic. This free-standing abortion facility began operating in May of 1973, some four months after the Supreme Court of the United States removed all restrictions on the performance of abortions in Minnesota.

The Meadowbrook Women's Clinic was organized by four Board Certified Obstetrician-Gynecologists who had practiced for many years in the metropolitan area of Minneapolis. The medical staff is currently composed of four Board Certified and one Board Eligible specialists. All are in the private practice of their specialty and each spends one day per week performing abortions in the Clinic.

The Clinic is situated in a modern medical office building attached to a large, suburban Minneapolis hospital. The laboratory facilities of the hospital are utilized and there is a verbal agreement in effect which allows for the rapid transport and admission to the hospital of any patient should a medical emergency arise. In the 38 months of operation, two patients have required emergency admission to this hospital for observation only. All members of the medical staff of the Meadowbrook Women's Clinic are active staff members of the attached hospital's Department of Obstetrics and Gynecology.

In addition to the five members of the Clinic's medical staff, the clinic employs a full time Administrator, and an Associate Administrator who also serves as the Director of Social Service. There is a full time laboratory technician, five nurse clinicians with special training in Obstetrics and Gynecology, 15 full and part time counselors and 10 other employees who share clerical and clinical duties. Two employees spend a majority of their time in data collection for the State of Minnesota Department of Health and the Joint Program for the Study of Abortion. This is a project of the Family Evaluation Planning Division of the Department of Health, Education and Welfare. This data is recorded and transmitted to the Center for Disease Control in Atlanta, Georgia. One senior counselor spends a major portion of her time with second trimester abortion patients who are admitted to a local teaching hospital in Minneapolis (Figures 1 and 2).

Since the Meadowbrook Women's Clinic began operation in May, 1973, approximately 20,000 abortions have been performed. Of these, 18,000 were first trimester abortions and 2,000 were second trimester terminations. Statistics from the Minnesota



CONFIDENTIAL under M.S. 144.053

Minnesota Department of Health
Center for Health Statistics
717 Delaware St., Mpls. 55440

REPORT OF INDUCED ABORTION

FACILITY INFORMATION

1 - Facility ID Code
2 - Type of Facility 1 = hospital inpatient 3 = non-hospital clinic
2 = hospital outpatient 4 = other

3 - Patient ID/Chart Number
4 - Patient's Residence
City or Village
County
State

MDH use only

5 - Patient's Age (Optional) Month Day Year Years

6 - Race or Ethnic Group (select one)
1 - White 3 = American Indian 5 = Other
2 - Black 4 = Mexican-American 6 = Unknown

7 - Marital Status (select one)
1 - never married 3 = widowed 5 = separated
2 = currently married 4 = divorced 6 = unknown

8 - Number of Prior Live Births to this Patient
9 - Number of Previous Induced Abortions to this Patient
10 - Contraception information (select one)
1 = I've never used any form of birth control
2 = I've used some type of birth control, but not when I got pregnant
3 = I was using contraception when I became pregnant

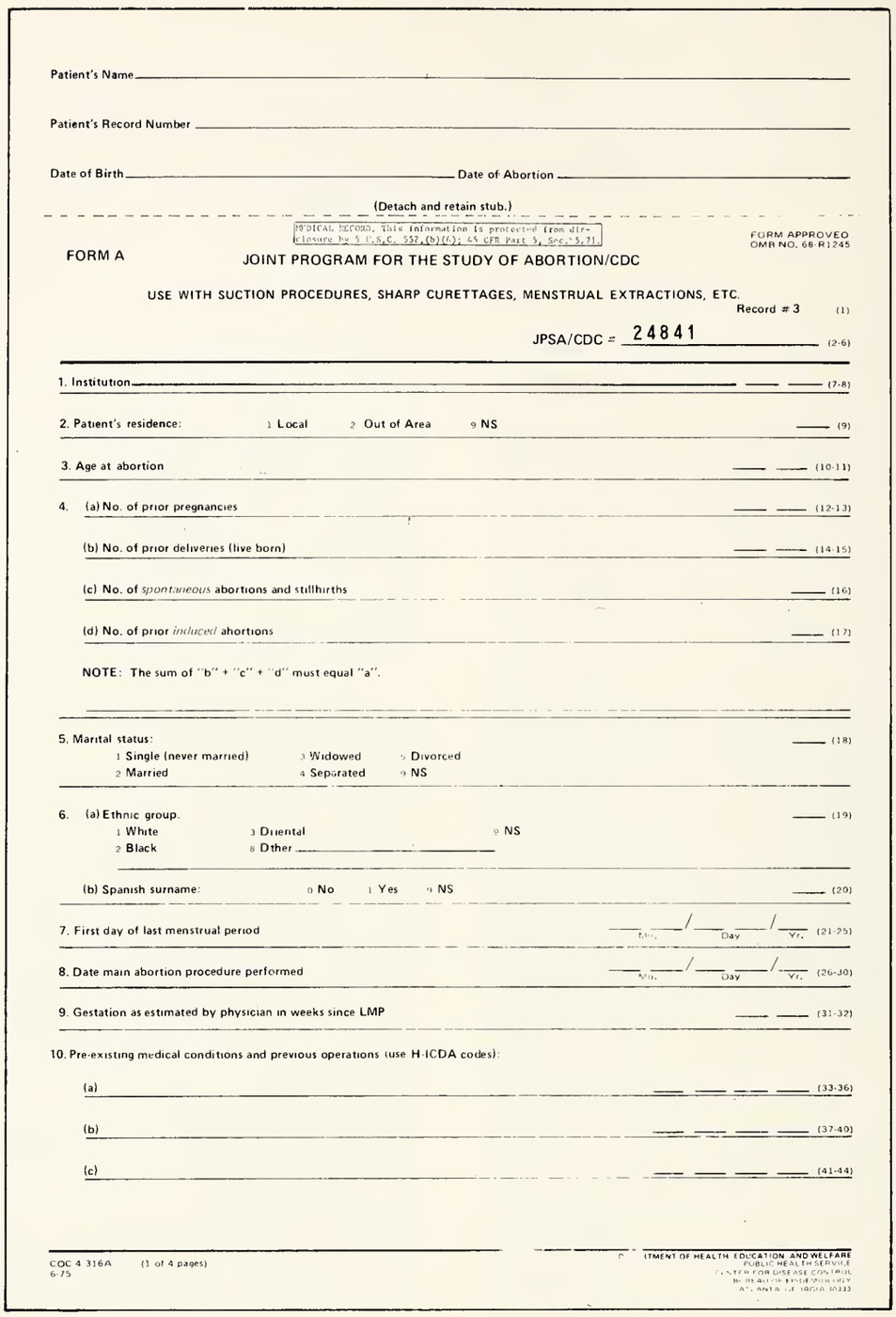
11 - Date of Abortion Procedure Month Day Year
12 - Date of Last Normal Menstrual Period (LMP) Month Day Year
13 - Physician's Estimate of Length of Gestation (Post LMP)

14 - Method of Termination (select one or primary method)
1 = auction curettage 5 = hysterectomy/hysterotomy
2 = sharp curettage 6 = other or combination (specify)
3 = saline/fluid exchange 7 = menstrual extraction (-/unk)
4 = prostaglandin 8 = menstrual extraction (+ path)

15 - Immediate Major Complications (24 hrs.)
0 = none 4 = cervical injury 8 = other
1 = hemorrhage 5 = uterine perforation
2 = pelvic infection 6 = retained products
3 = fever only 7 = failure, continuing pregnancy

Fig. 1—Data reported to the Minnesota Department of Health.

*Medical Director, Meadowbrook Women's Clinic, St. Louis Park, Minnesota.



Patient's Name _____

Patient's Record Number _____

Date of Birth _____ Date of Abortion _____

(Detach and retain stub.)

MEDICAL RECORD. This information is protected from disclosure by 5 U.S.C. 552a(b)(6); 45 CFR Part 5, Sec. 5.71.

FORM APPROVED
OMB NO. 68-R1245

FORM A

JOINT PROGRAM FOR THE STUDY OF ABORTION/CDC

USE WITH SUCTION PROCEDURES, SHARP CURETTAGES, MENSTRUAL EXTRACTIONS, ETC.

Record # 3 (1)

JPSA/CDC # 24841 (2-6)

1. Institution _____ (7-8)

2. Patient's residence: 1 Local 2 Out of Area 9 NS (9)

3. Age at abortion (10-11)

4. (a) No. of prior pregnancies (12-13)

(b) No. of prior deliveries (live born) (14-15)

(c) No. of *spontaneous* abortions and stillbirths (16)

(d) No. of prior *induced* abortions (17)

NOTE: The sum of "b" + "c" + "d" must equal "a".

5. Marital status: (18)
1 Single (never married) 3 Widowed 5 Divorced
2 Married 4 Separated 9 NS

6. (a) Ethnic group. (19)
1 White 3 Oriental 9 NS
2 Black 8 Other _____

(b) Spanish surname: 0 No 1 Yes 9 NS (20)

7. First day of last menstrual period ___/___/___ (21-25)
Mo. Day Yr.

8. Date main abortion procedure performed ___/___/___ (26-30)
Mo. Day Yr.

9. Gestation as estimated by physician in weeks since LMP (31-32)

10. Pre-existing medical conditions and previous operations (use H-ICDA codes):

(a) (33-36)

(b) (37-40)

(c) (41-44)

CDC 4 316A (1 of 4 pages)
6-75

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL
BUREAU OF EPIDEMIOLOGY
ATLANTA, GEORGIA 30333

Fig. 2—Data reported to the Center for Disease Control.

Department of Health estimate that approximately 60-65% of all abortions performed in Minnesota are performed at the Meadowbrook Women's Clinic. Only first trimester abortions are performed in the Clinic. No pregnancy of duration greater than 13.6 weeks as calculated from the last menstrual period or 11.6 weeks from conception is terminated in the Clinic. Pregnancies in duration up to 19.6 weeks from the last menstrual period are terminated as in-patients in the hospital.

The patient, when she requests information about abortion, is given a specific time for her appointment. She is told that she will spend approximately four hours in the Clinic, that she should bring a confirmation of her pregnant state and that she should be accompanied by a person of her choice. She is asked about her general physical health; whether she is receiving medications which might interfere with the planned procedure. She is then sent specific information and instructions as to her experience at the Clinic.

After registering at the clinic, she is taken to the laboratory where blood is drawn for a hemoglobin determination, for a serologic test for syphilis and for the determination of her Rh status. A complete

urinalysis is performed. A pregnancy test is not performed at this time but may be performed later if indicated.

A nurse clinician then examines the patient and takes a modified medical history. This will be described in detail later when considering pre-abortion procedures. The nurse describes to the patient the procedure for early first trimester abortion. The patient then sees a film which describes the methods of birth control. Following this, the patient is seen by a counselor who determines whether the patient voluntarily requests the abortion or whether she feels she is being coerced into the performance of the abortion by a parent, sexual partner or someone else. The alternatives to abortion are discussed. It is not unusual for a patient at this point to decide not to have the pregnancy terminated. Some patients are encouraged to rethink their decision and return at some future time if they are not prepared to make a decision at that moment. The counseling aspect will be presented in detail in a subsequent paper by the Administrator of the Clinic whose responsibility it is, along with the Associate Administrator, to train the counselors of the Clinic.

All patients are given contraceptive information and are encouraged to make a decision about future contraception. A film is shown which explains in detail all of the currently available methods of contraception. No patient leaves the premises of the Clinic without being given the opportunity of choosing a method of contraception. The Clinic staff gives her the opportunity of knowing what is available; the patient chooses the method which is acceptable to her.

While the patient is awaiting the abortion, all visitors who accompanied the patient are invited to participate in a group information session. The visitors are encouraged to participate in a discussion of the abortion procedure; they are instructed in their role of giving emotional support to the patient having the abortion. They are instructed in all phases of contraception, and the males present are made aware of their responsibilities in preventing future pregnancies. The group then sees a film about early abortion. This visitor's group has had surprising results as indicated on the questionnaires received by the Clinic after the abortion patient returns the form given to her. Visitors feel impressed at the effort made on their behalf; they welcome the instruction and information given to them and they value the importance placed by Clinic personnel on their active participation in the abortion process and decision. They realize that the responsibility many times rests on them even though they were not the persons involved in becoming pregnant.

The early first trimester pregnancies are terminated under a 1% Lidocaine Paracervical block (Figures 3 and 4). No pre-operative medication is administered except in rare instances where the patient's fear and apprehension is clinically judged to be marked. These patients receive 5 or 10 mgm. of Valium orally. All patients arrive in the Clinic in a fasting state. The physician performing the abortion reviews the medical history previously obtained by the nurse clinician. He then examines the patient to confirm the presence of a

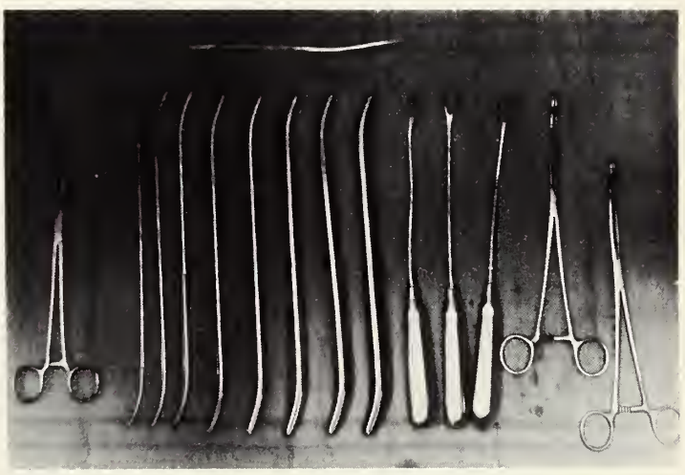


Fig. 3—Instrument tray for first trimester pregnancies.



Fig. 4—Total instrumentation.

pregnancy; he determines uterine size; and he ascertains the uterine position. The external genitalia are cleansed with Betadine. The patient has emptied her bladder prior to being brought to the procedure room. A speculum is inserted and the vagina is cleansed with Betadine. The paracervical block is now inserted with 10-15 cc. of 1% Lidocaine. Approximately 1-2 cc. of this same solution is placed submucosally on the anterior lip of the cervix at the position where the tenaculum will be attached. The tenaculum is inserted through the external os of the cervix instead of placing it transversely below the bladder reflection. Only a single toothed tenaculum is used; the multi-toothed instrument tends to produce excessive trauma.

The uterine sound is not used to determine either the direction of the uterine cavity or its depth. We feel that most uterine perforations occur with the uterine sound. This same information can be gained by the use of the cervical dilators. The medical staff of the Meadowbrook Women's Clinic prefers the Pratt Cervical Dilators instead of the Hegar Dilators. The former are more tapered and longer, thereby simplifying their use. The cervical canal is now dilated to a sufficient diameter to easily accommodate the smallest vacurette possible to accomplish uterine evacuation. Gentleness in dilating is most important in preventing cervical trauma.

After the cervical canal has been sufficiently dilated, the Karman Canula or Berkeley Vacurette is inserted into the uterine cavity. The vacuum source is now attached and the uterine evacuation is performed in 10-30 seconds (Figures 5 and 6).

When no further amniotic fluid or fetal or placental or decidual tissue is noted in the plastic tubing, the endometrial cavity is curetted with a sharp curette. The vacuum source is used once again and all of the instruments except the speculum are removed. On occasion a sterile surgical sponge is used to apply pressure on the site of tenaculum attachment on the cervix to prevent excessive bleeding.

The tissue removed is then examined grossly for the presence or absence of fetal membranes or fetal parts. Placental tissue can usually be differentiated from decidual tissue because of its ability to float in a saline solution and because of its feathery, arbor-like characteristics.

The patient is then taken to the recovery room where nurse practitioners check vital signs frequently. The amount of vaginal bleeding is determined. The method of contraception chosen by the patient is once again discussed with her, and she is given a supply of the contraceptive chosen. The patient receives the Rh

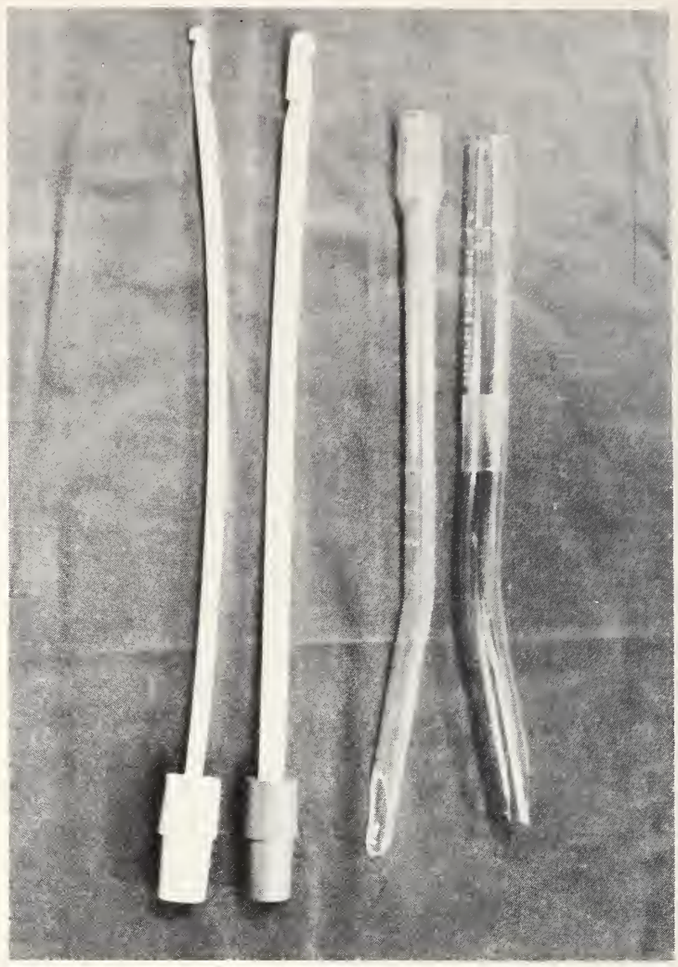


Figure 5



Fig. 6—Berkeley Vacuum Apparatus.

immune globulin injection if she has Rh negative blood.

The patient is also given an oxytocic agent to be taken qid for three days and a broad spectrum antibiotic to be taken qid for five days. The patient is fed and remains in the recovery room from 30 to 60 minutes or longer if required. She is discharged to her accompanying visitor and is given an appointment for a two-week post-abortion checkup. If the patient prefers to be seen by the referring physician or elsewhere she is encouraged to do so in two weeks. No charge is made for the drugs furnished the patient or the contraceptives supplied to her and no fee is charged for the two week post-abortion examination if seen by Meadowbrook's medical staff. The patient is urged to return the questionnaire to the Clinic as well as to furnish the medical staff with a report on the two week post-abortion checkup if she is seen elsewhere. The Clinic is anxious to know of any problems that occurred during or after the procedure performed. The patient is further encouraged to call the Meadowbrook Women's Clinic, day or night if any questions or problems arise. The Clinic telephone is answered day and night and all calls to the Clinic are paid by the Clinic. The medical staff will treat any complication the patient may develop without an additional fee if the patient chooses to present herself for care to the Clinic.

Pre-Procedure Considerations

As previously mentioned, a modified medical history is taken by a nurse practitioner-clinician with special training in obstetrics and gynecology. A history of pertinent previous illnesses and surgery is detailed. A family history is obtained with particular reference to diseases such as diabetes, hypertension, etc. A history of allergies to drugs is obtained. Specific questions as to the last menstrual period are asked in an attempt to historically document the duration of the gestation.

A physical examination is then performed by the nurse clinician. Breasts are examined; blood pressure, temperature and pulse are recorded. A cervical Pap smear is obtained unless the patient has had a negative cervical cytologic smear within the previous year. A cervical culture for gonorrhea is obtained on all patients except those whose referring physician or agency have already performed this test.

TABLE 1

Results of Gonorrhea Screening at Meadowbrook Women's Clinic

Number of smears taken	Number of positive cultures
18,000	122

If a positive culture is reported to the Clinic, the patient is immediately notified. She is given the option of receiving treatment at the Clinic or by a physician or agency of her choice. We use Benemid one gram orally followed by 4.8 million units of intramuscular procaine penicillin. The patient is encouraged to return for a second culture at two weeks and for another serologic test for syphilis at a later time. She is urged to have her sexual partner seen for treatment at a place of his choice. It is of interest that we are not aware of a single patient aborted at the Meadowbrook Women's Clinic who had gonorrhea at the time the abortion was performed who developed pelvic inflammatory disease. This same experience has been reported by others as well.

Uterine size is now evaluated and compared with the menstrual history. A physician is called to perform a second pelvic examination if there is a discrepancy between the length of gestation as determined from the last menstrual period and the physical examination. Ovarian cysts are occasionally discovered for the first time and genital anomalies are detected as well. Several patients with duplication of the generative tract have been discovered. Vaginal septae, bands and double vaginas and cervices have been seen. The patient is then encouraged to be further evaluated by her private physician. She is encouraged to have intravenous pyelography performed to detect urinary tract anomalies which many times accompany generative tract malformations.

The laboratory tests performed have been described. Pregnancy tests are frequently done in the face of little or no uteromegaly. All patients whose hemoglobin determinations show a hemoglobin value of 11.0 gms. % or less are given a prescription for oral iron. Proteinuria is detected frequently and if microscopic analysis reveals the presence of red or white blood cells the patient is given a prescription of a sulfa preparation and is encouraged to have a repeat urinalysis performed by her private physician. No medical information is released without the patient's request and consent.

TABLE 2

Results of Cervical Cytology Screening at Meadowbrook Women's Clinic

Number of Smears	3,743
Number of Class II Smears	122
Number of Class III Smears	16
Number of Class IV Smears	3

Since May of 1973, a total of 3,743 cervical cytologic smears have been obtained. The breakdown is shown above. Patients are notified of the results of their smear tests and are urged by letter to seek follow-up. Several instances of moderate and severe epithelial cervical dysplasia have been found and several early carcinomas-in-situ have been detected. It is vitally important to perform Pap smears on as many of the patients who have not had a Pap test within the last year as possible since in many instances this will be the only time the patient presents herself for pelvic examination. Several authors have reported in the literature the higher than usual frequency of abnormal cervical cytology found in this group of sexually active patients, especially teen-agers.

Vaginal secretions are examined for the presence of trichomoniasis and moniliasis. Where discovered, proper therapy is instituted. Pediculosis pubis is seen on occasion and treated as well. In the pre-procedure examination of second trimester abortion patients an evaluation of heart and lungs is performed. Several instances of previously undetected Rheumatic and Congenital Heart Disease have been discovered. One patient with acute, active tuberculosis has been found and several early asthmatic patients have been referred for further medical care.

Intra-Procedure Considerations

As previously mentioned, it is during the uterine evacuation that uterine septae are detected, bicornuate uteri are found and on occasion total duplication of uterus, vagina and cervix is seen for the first time. Several instances have occurred where both uterine horns or separate uteri have been evacuated with the products of pregnancy found on one side and decidua in the other.

Uterine perforations have occurred in 7 instances out of the approximately 18,000 first trimester patients treated. None have occurred in the 2,000 second trimester patients. Four of these perforations took place within the first few months of the operation of the Clinic when the medical staff had little experience with this new technique. Three of these patients were observed for several hours in the recovery room and no further treatment was required. As soon as the perforation became apparent, the procedure was abandoned and the patients were asked to return in two weeks for a repeat aspiration.

At the second attempt, the abortion was completed without incident. Two additional patients not included in the 7 perforations were referred to us after perforation occurred elsewhere. These patients were re-aspirated and again no further problems arose.

The other patients were hospitalized at once. One patient was referred back to her own physician at her request. She was admitted for observation. The patient became febrile. An adnexal mass developed secondary to a presumed broad ligament hematoma. One patient was subjected to laparoscopy, the perforation was identified and no further treatment was required. One patient was laparoscoped and was noted to have intra-abdominal hemorrhage from a laceration of the uterine artery. Laparotomy was performed and the bleeding vessel was ligated. One patient requested vacuum aspiration under general anesthesia. Perforation occurred and a bowel injury was suspected. Laparotomy confirmed a laceration of bowel, this was repaired and the patient left the hospital in 5 days. No other serious complication is known to us except several instances of pelvic inflammatory disease treated successfully on an out-patient basis with antibiotics. The known perforation rate then is 7 per 18,000. No surgical procedure can be performed that many times without trauma of some sort occurring.

Most instances of uterine perforation are caused by the creation of a false passage during cervical dilatation. On occasion, patients are seen with extreme degrees of cervical stenosis which makes dilatation extremely difficult. Great care must be taken here or perforations can readily take place. Slow and gentle dilatation is required especially in young, primigravid patients whose pregnancies are less than 7-8 weeks of gestation. When menstrual extractions or endometrial aspirations are performed, defining these as procedures done on patients where the period of amenorrhea is less than two weeks and where the standard, slide pregnancy test is negative, extreme care must be taken since the cervix is usually quite rigid and the endocervical canal is difficult to dilate. Very few of these procedures are done at the Meadowbrook Women's Clinic and our experience shows the presence of chorionic villi in about 65% of the patients so treated. As the length of amenorrhea increases, the chance of pregnancy is increased as defined by the presence of chorionic villi in the tissue specimens.

Menstrual extractions are performed only on those patients who do not wish to know whether they are pregnant or who cannot wait to have a pregnancy confirmed by a positive pregnancy test. All patients so treated are warned about the possibility that the pregnancy may continue because of the increased incidence of lack of products of conception found in the microscopic examination of the tissue removed at the time of aspiration. A repeat pregnancy test is done at the two week post-abortion examination. Recently a

patient was seen whose menstrual extraction tissue showed only decidua but when re-aspirated in two weeks chorionic villi were found.

To the best of our knowledge, only 4 patients were treated at the Clinic, whose pregnancy test was positive at the time of the original aspiration and whose pregnancies continued. Three of these patients were early in the first trimester of pregnancy, they were re-aspirated and the pregnancy terminated successfully. One patient failed to return and was seen again 17-18 weeks pregnant. She was successfully aborted with intra-amniotic prostaglandin.

We have become aware of what has been termed the "post-abortal syndrome". Soon after the original intra-uterine evacuation the patient experiences severe abdominal pain out of proportion to the usual post-abortal pelvic cramps. These patients are immediately re-aspirated and the uterine cavity is filled with blood clots. The pain immediately subsides and no further therapy is required. It is assumed that a clot forms at the internal cervical os which prevents the collected blood from escaping. The uterus contracts but is unable to expel the blood collected within the uterine cavity. Our recovery room nurses recognize this syndrome quickly and re-aspiration promptly relieves the symptoms.

Seizures have been noted in several instances in patients after the Lidocaine blocks. None of these patients had previous seizure episodes. The patients received immediate care, the procedure was completed and follow-up instructions were given. Occasionally vagal reactions will occur requiring only supportive care. No fatalities have taken place in our experience with any of our first or second trimester abortion patients in approximately 20,000 patients treated.

Post-Procedure Considerations

The medical considerations in this category fall into the early and late complications, that is, those occurring within one month of the procedure and those occurring thereafter. The problems seen in first trimester patients are different compared to those taking place when the pregnancy is terminated later in the gestational period. The early complications are best divided into those occurring immediately and those that are delayed.

First Trimester Immediate Complications

Perforations of the uterine cavity have already been described. The fact that bowel or bladder injuries can occur has been eluded to. Seizures and minor fainting episodes have been mentioned. Excessive bleeding is extremely rare. Only an occasional patient will require intramuscular oxytocin post-procedure. In over approximately 18,000 first trimester abortions performed at the Meadowbrook Women's Clinic, in only two instances was it felt to be medically indicated to start an intravenous infusion. Cervical lacerations are uncommon if dilatation of the cervix is performed slowly and gently. If a laceration occurs it can be sutured in the Clinic.

Second Trimester Early, Immediate Complications

When the Meadowbrook Women's Clinic medical staff first began to perform second trimester abortions no patient was accepted for pregnancy termination from the end of the 11th week of pregnancy until the beginning of the 16th week of pregnancy from the last menstrual period. All second trimester abortions were performed after the beginning of the 16th week of gestation as calculated from the last menstrual period and confirmed by uterine size. All second trimester abortions were performed by the then accepted method of injecting hypertonic saline transabdominally intra-amniotically. The process of uterine activity was augmented with intravenous Pitocin. Laminaria tents were added to the protocol at a later time to hasten cervical dilatation and effacement. No patient treated in such a protocol developed water intoxication because extreme care was taken in observing these patients by daily weight determinations and using intravenous fluids containing electrolytes. The complication of water intoxication has been well documented. It can produce seizures, coma and has produced fatalities as well.

Disseminated intravascular coagulopathy has been observed by us. Baseline blood coagulation studies were performed on all patients on admission. Blood was available for transfusion and specific cryoprecipate material was immediately available should hypofibrinogenemia develop. Several instances of fibrinogen depletion were seen and these patients were treated successfully. No serious complications took place and very few patients required blood replacement.

The development of cervico-vaginal fistulas has been described in the literature. These seem most likely to occur in young, primigravid patients where forcible uterine contractions produce rupture of a rigid, undilatable cervix or even the lower uterine segment. We have observed this in three patients. The lacerations were repaired and no further therapy was required. Manual removal of the placenta by use of ring forceps and curettage is not uncommon when hypertonic saline is used since placental retention occurs in a significant percentage of cases. Excessive bleeding is uncommon in our experience.

Since we began to perform second trimester abortions, no patient has been accepted for care by the Clinic after the beginning of the 20th week of gestation, unless there are specific indications for abortion such as a genetically determined fetal anomaly incompatible with life or a maternal medical problem serious enough to endanger the life of the mother. All patients seen by us whose gestation is greater than 20 weeks are referred elsewhere. Sonography is performed on all patients where there is doubt about the duration of the pregnancy or there is massive maternal obesity making the examination difficult.

Second trimester abortion patients who are candidates for pregnancy termination are examined in the Clinic. Arrangements are made for hospital admission. If the patient is between 12-16 weeks pregnant from the last menstrual period, 2 or 3 laminaria tents are inserted the afternoon before the procedure is to be performed. The patient is admitted to the outpatient abortion unit of the hospital early the following morning. Under local anesthesia a vacuum aspiration combined with curettage is performed. The patient is observed in the hospital for an appropriate period of time and is then discharged with oxytocics, antibiotics, and contraceptives. Rh immune globulin is given if indicated, and she is urged to return for a 2 week post-abortion exam. A counselor from the Clinic is with the patient during her hospital stay to give support, information and comfort.

If the second trimester patient to be aborted is between 16-20 weeks pregnant, no laminaria are inserted the day before. She is admitted as an inpatient and 40 mgm. of Prostaglandin $F_{2}\alpha$ are injected intra-amniotically by the transabdominal route. Two or three laminaria tents are then inserted and intravenous oxytocin is begun four hours later. The average injection to abortion time is approximately 14-18 hours. After the products of pregnancy have been passed the patient is given an injection of Deladumone to prevent breast engorgement. The patient is given the same medications mentioned previously and is discharged the following morning. Using the above protocol, it is uncommon to have to re-inject the patient but rarely an additional 20 mgm. of Prostaglandin is injected.

Since this protocol has been utilized, and the use of hypertonic saline discontinued, no patients with disseminated intravascular coagulopathy or cervico-vaginal fistulas have been seen.

First Trimester Early, Delayed Complications

The examination of all tissue removed from the uterine cavity is imperative. The presence of placental tissue, fetal parts or membranes is required to demonstrate that the pregnancy has been successfully interrupted. Decidual tissue is not a sufficient histologic criterion to allow one to assume that pregnancy termination has taken place. A high index of suspicion is required in the presence of amenorrhea, uterine enlargement, a positive pregnancy test and a report of decidua or deciduoid tissue on a pathology report, that an ectopic pregnancy may be present. We have seen several instances of unruptured ectopic tubal gestations detected by not obtaining products of conception from the uterine cavity at the time of the aspiration. These cases have been reported elsewhere. If a pathology report is received which fails to show chorionic villi, fetal membranes or parts, the patient must be immediately notified to seek medical care to rule out the presence of an ectopic gestation. Any patient with severe abdominal pain post-abortally must be examined for the presence of an ectopic gestation. She may feel secure in the knowledge that her uterus has been emptied and may not relate the abdominal pain to the presence of a pregnancy in an ectopic location.

A recent patient treated by the medical staff of the Meadowbrook Women's Clinic demonstrates the necessity of determining the uterine contents aspirated when the abortion is performed. A multipara presented herself to her physician with amenorrhea and a suspicion of an unwanted pregnancy. Endometrial aspiration was performed in the office and decidual tissue was obtained. She continued to "feel pregnant" and was subsequently admitted to a hospital where a D&C was carried out under general anesthesia. Again the tissue report showed decidua with fragments of chorionic villi. She returned for a post-abortion checkup and the uterus was still enlarged commensurate with her last menstrual period. A third D&C was performed, again under general anesthesia, but again the tissue report failed to show any evidence of fetal membranes or fetal parts nor was any placental tissue identified. The patient was referred to the Meadowbrook Women's Clinic medical staff where she was found to be 17-18 weeks pregnant. Sonography showed normal fetal development commensurate with her last menstrual period. A uterine anomaly was suspected but examination failed to substantiate this suspicion. Intra-amniotic prostaglandin was injected and the patient aborted a fetus of 17-18 weeks gestation.

First and Second Trimester Early, Delayed Complications

Bleeding in proportions considered excessive is rare. Blood loss rarely exceeds 50 cc. in early second trimester abortions done with laminaria and a combination vacuum abortion and curettage. Occasionally giving oxytocic agents prior to performing the abortion when the uterus feels soft and tense decreases the blood loss. No first trimester abortion patients treated at the Meadowbrook Women's Clinic have received blood replacement. Delayed hemorrhage is most uncommon in our experience.

Many phone calls are received from patients whose abortion had been performed several days prior to the call. Most problems are not serious and will take care of themselves provided the patient receives reassurance that no serious problems exist. Occasionally we receive a report from a patient who consulted her local doctor with what she felt was excessive bleeding. An immediate D&C is performed under general anesthesia. Tissue reports usually show the presence of necrotic decidua and occasional fragments of degenerating chorionic villi. Most of these repeat D&C procedures are unnecessary. The local physician will, on occasion, tell the patient that the original aspiration resulted in an incomplete abortion based upon the presence of fragments of villi.

When aspiration and curettage are done not every fragment of decidua and placenta is removed. This is well documented by doing a D&C prior to hysterectomy and inspecting the uterine cavity of the excised uterus. Not all of the endometrium is denuded and as a matter of fact, the curettage should not be done too vigorously. Fragments of tissue will pass spontaneously. The only indication for a D&C after an abortion should be profuse post-abortion hemorrhage and suspected endometritis secondary to retained placental tissue.

Post-abortal infection is usually secondary to retained products of conception. Antibiotics and D&C are the treatment of choice. As previously mentioned, all Clinic patients, are urged to return to the Clinic or a physician of their choice for a post-abortion examination. If a complication develops which is related to the abortion and the patient is not covered by insurance, the hospital expenses and physician fees are paid by the Clinic. We are aware that many patients come to the Clinic for abortion care whose place of residence is a great distance from the Metropolitan area of our state. These patients are not in the position to return to the Clinic for further care and are instructed to seek medical care in their own communities. We offer medical care to all patients treated by us at our expense if the complication that develops is related to the previous abortion procedure.

We have seen no first trimester abortion patients who have developed post-abortion septicemia or pelvic thrombophlebitis. One patient, a registered nurse, was recently admitted by us to a local hospital within 48 hours after the abortion. She was admitted with a fever of 104° and abdominal tenderness. Pelvic examination was essentially negative. Endometrial and cervical culture failed to show any pathogenic organisms. She was started on massive doses of intravenous antibiotics. Her physical findings were minimal yet temperature spikes occurred daily to 103°-104°. The presumptive diagnosis of gram negative septicemia was made and she was treated with steroids and massive doses of various antibiotics. Blood cultures failed to grow any organisms. Pelvic thrombophlebitis was suspected and anticoagulants were begun. Her clinical condition did not improve and a suspicion arose about the validity of her daily fever. She was finally caught in the act of falsifying her temperature. She had been re-curetted under anesthesia and no retained products of pregnancy were found. We were seriously considering performing a hysterectomy but fortunately at laparoscopy no salpingitis or any source of pelvic sepsis was found. This patient subjected herself to several surgical procedures, to massive doses of extremely toxic drugs and anticoagulants. She was referred for psychiatric care which she subsequently refused.

Post-abortal depression of severe proportions is a rare occurrence. We are aware of only two patients who required psychiatric help after an elective abortion. Both were patients who had received psychiatric care prior to terminating their pregnancies. The world psychiatric literature, in particular the American, tends to bear out the fact that serious psychiatric sequelae rarely take place. In the patient with a previous psychiatric dysfunction the abortion does not cure the basic emotional problem. It does, however, not make it any worse. It is certainly not uncommon for many women to experience a mild and transient post-abortion depressive reaction. This seems to be short-lived and self-limiting. Feelings of guilt and sadness and unhappiness are common and probably quite normal. Supportive care from family and friends alleviates these feelings quickly. The most common response, made in the questionnaire patients return to the Clinic, is a sense of relief. These short-lived emotional symptoms are explained to the patient prior to the abortion. Patients then are not

frightened and surprised when they experience sadness and guilt for a short period of time after the abortion.

First and Second Trimester Late Complications

Rh sensitization is a possible complication which should rarely occur since not all women are entirely protected from sensitization even though they receive Rh immune globulin when they are Rh negative. It has been demonstrated that Rh sensitization may occur in patients having abortions, even early in gestation. It is forgotten that any woman aborting, whether spontaneously or induced, if Rh negative, should receive the Rh immune globulin. Rh positive fetal red blood cells may cross the placental barrier and stimulate the production of Rh antibodies in the Rh negative woman.

All patients found to be Rh negative are urged to receive the Rh immune globulin. If a patient refuses such an injection she signs a medical release form. Occasionally women will refuse the injection because they have decided on tubal sterilization or their sexual partner is contemplating a vasectomy. We urge these patients to receive the vaccine because patients do change their minds. When the crisis situation fades into the distance, the decision previously made under the stress of an unwanted pregnancy becomes less important. We offer many patients a combined abortion-laparoscopic tubal cautery and division procedure to be done in a hospital under general anesthesia. The response to such suggestion has been remarkable—many patients were not aware that both procedures could be performed simultaneously.

There has been much controversy about the possible ultimate development of complications which might be related to previous abortion procedures. Papers from Japan, the Scandinavian countries and especially Eastern European countries give conflicting opinions. Some studies tend to show the incidence of ectopic tubal pregnancy, prematurity, immaturity, low birth weight infants, incompetent cervices and infertility have increased markedly since the advent of abortion on request. Other papers have refuted these reports showing that the incidence of these complications has absolutely nothing to do with prior abortions.

Almost all of the studies suggesting an increasing incidence of these complications are retrospective and rely on patient recall. Most do not take into consideration the age of the patient, the parity, the socio-economic factors which might be responsible, such as nutrition and family income. It is safe to say that there is no conclusive evidence yet available that a prior abortion or abortions has a deleterious effect on future pregnancies. It is also safe to suggest that prior abortions may have such an effect. Studies underway in the United States at the present time will hopefully produce conclusive results in several years.

Serious psychiatric long-term sequelae are almost nonexistent. Many published reports substantiate the fact that such sequelae are extremely rare.

Summary

Recent legal and legislative rulings have clarified the abortion issue for the patient and her physician. There are currently no legal restrictions on performing abortions upon the request of the patient until the fetus has attained the stage of viability. Patients may now request and physicians may now perform pregnancy terminations without the risk of criminal prosecution. The state may no longer prohibit abortion; the state may no longer decide how, when or why a pregnancy is to be terminated.

Physicians performing abortions or referring patients for abortion services must be familiar with the medical technique of terminating unwanted pregnancies. They must also be aware of the complications that might arise so that they can give their patients the best care and advice possible. Until physicians are willing to give contraceptive advice to all sexually active patients, men as well as women, unwanted pregnancies will continue to take place. Even then not all men and women will utilize the contraceptive advice given to them. Unwanted pregnancies will always take place for a variety of reasons. Contraceptive failures occur frequently enough so that even if all patients used protection, unwanted pregnancies would still occur. It is far better to prevent a pregnancy than to terminate it once conception has taken place.

Abortion is here to stay. It behooves all of us physicians dealing with patients to utilize our skills and knowledge in the most humane manner possible. We may not agree with abortion as a means of solving an unwanted pregnancy. We must, however, not use our power as physicians to force a woman to carry an unwanted pregnancy to term. The Supreme Court decision on abortion has given women the freedom of choice. The medical profession must make that choice not only available but also possible.

Addendum

On June 20, 1977 the United States Supreme Court held, six to three, that neither Title XIX (Medicaid) of the Social Security Act nor the Constitution *requires* states to pay Medicaid benefits for abortions which "are not medically necessary." The Court also ruled that public hospitals are not required to provide abortion services. In other words, states *may* pay

Medicaid benefits for any abortion, and public hospitals *may* provide abortion services; there is no requirement that states and public hospitals provide such a service to patients.

What effect this ruling will have on indigent women is, of course, unknown. Only time will tell whether women with unwanted pregnancies will continue to carry such gestations to term or whether they will abort themselves or seek the care of nonprofessional criminal abortionists. It has been prophesized that there will again be a marked increase in the incidence of self-inflicted and criminal abortions with the attendant physical and emotional damage these procedures cause.

In 1977 the Minnesota Legislature passed a bill which prohibits the use of Medicaid funds for the elective termination of pregnancy unless the mother's life is endangered with the continuation of the pregnancy.

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The Minnesota Urological Society elected the following officers:

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The scheduled meetings of the M.U.S. for the 1978-79 year are:

Fall Seminar:	September 14-17, 1978 at Grandview Lodge, Brainerd MN	
Pyelogram Conferences:	Friday, November 17, 1978	Notices to be sent out
	Friday, January 19, 1979	regarding times of
	Friday, February 16, 1979	these meetings.
	Friday, March 15, 1979	

For further information contact: Helen Chanak, 3625 W. 65th St., Minneapolis, 55435 (920-7660).

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Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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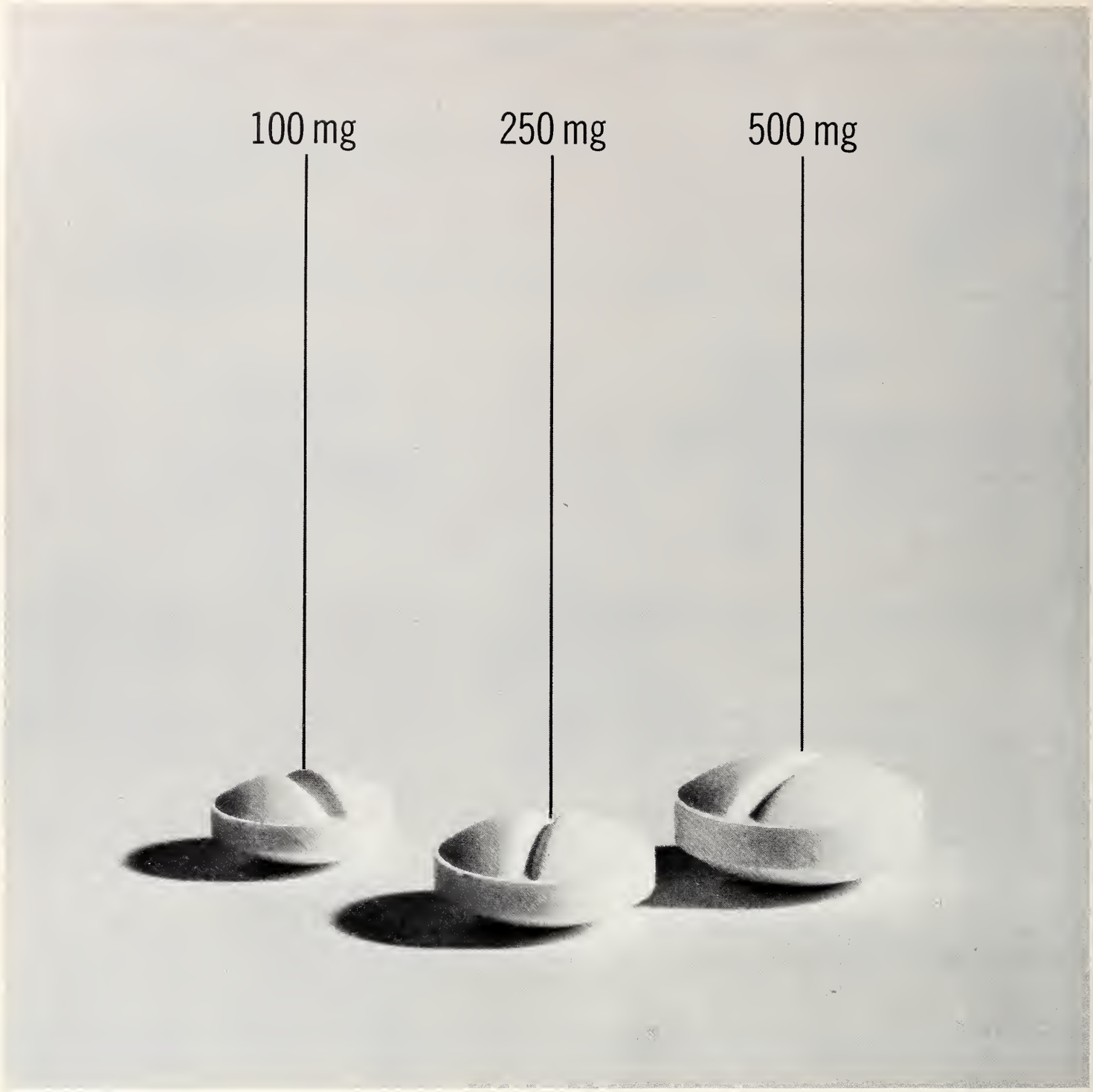
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President's Letter

American Medicine

It was a great thrill for me to recently represent MMA at the inauguration of the new AMA President, Dr. Tom Nesbitt, during the 127th Annual AMA Convention. Somehow it was the most meaningful symbolism I've experienced in this office.

Dr. Nesbitt, in a stirring address, asked individual physicians to voluntarily reduce the rate of escalation of their fees by 1% in each of the next two years. The idea of this request is to resist inflationary pressures from overhead expenses sufficiently so that the fee inflation rate is slowed enough to approximate the inflation rate of the total economy. This is a reasonable request, and from my arithmetic something achievable by some overhead cost tightening and personal restraint with little in the way of personal sacrifice. It was a considered and important request which all physicians would be well advised to follow.

In the same address Dr. Nesbitt pointedly attacked the present Federal Administration's health policies as inconsistent and called some of its efforts irresponsible. He cited examples of apparent attempts to sabotage our voluntary effort while calling for voluntarism in cost restraint from many segments of our society. He clearly threw down the gauntlet on many issues including further government intrusion into medical care, which would have the effect of diminishing quality of research and services and ultimately rationing the quantity of services.

This convention spent considerable time discussing the report of the National Commission on the Cost of Health Care. In general, those recommendations which had to do with attempts to increase cost consciousness of purchasers, users and vendors of medical care were approved. Those items which have far reaching effects in altering modes of practice were in general referred to appropriate committees and councils for further study. A few items such as certificate of need for physicians' offices were rejected outright.

The biggest game in town this side of Washington D.C. is medical cost control. It seems apparent that rightly or wrongly the present medical care system is going to be forced into some changes by societal attitudes and demands. Just as the medical community reacts to new scientific knowledge, it will demand that those changes be consistent with reasonable progress in achievable delivery of preventive and therapeutic services. The AMA has for over one and a quarter centuries been the ultimate guarantor of quality standards in American medicine and is not about to abdicate that responsiblity. So long as financing mechanisms and strategies do not deny any citizen his right to unimpeded professional judgments made in his behalf, American medicine can adapt within intelligent limits to any reasonable demand.

Robert S. Flom

Robert S. Flom, M.D.
President
Minnesota Medical Association

Cover Watercolor

"Minnehaha Creek"

Dr. E. Theodore Palm, Minneapolis surgeon, practicing at Fairview Southdale, Metropolitan Medical Center and Methodist Hospitals, painted the cover watercolor one early morning last Spring. It is painted on Arches paper, and the original size is 15 x 20 inches.

This particular scene is on Minnehaha Creek as it flows along the Minnehaha Parkway between Lyndale and Nicollet Avenues in south Minneapolis.

Dr. Palm studied at the Minneapolis School of Art in addition to being a graduate of Gustavus Adolphus College and the University of Minnesota.

Continuing Medical Education

St. Paul Rehabilitation Center

Conference Title: Accountability Beyond Hospital Walls, Date: November 11, 1978, Place: Sheraton Inn, Minneapolis.

This conference is designed to promote an understanding of the multiplicity of problems which the client experiences upon hospital discharge.

Sponsored by: St. Paul Rehabilitation Center and Ramsey County Nursing Service.

For further information, contact: Ann Ring or Terry Bergstrom, (SPRC 227-8471).

Gillette Children's Hospital Special Issue

The Editors of MINNESOTA MEDICINE are pleased to run Part II of the Special Gillette Children's Hospital Issue. Part I was published in the March, 1978 issue of the Journal.

Minnesota Medical Association
1979 Annual Meeting
May 17-18 — Radisson St. Paul

The "Gillette" Sitting Support Orthosis for Non-ambulatory Children with Severe Cerebral Palsy or Advanced Muscular Dystrophy

J. MARTIN CARLSON, M.S.* and ROBERT WINTER, M.D.†

This paper presents a brief review of the need for better sitting support for those children confined to a wheel chair and lack the voluntary means to sit with good posture. The "Gillette" Sitting Support Orthosis consists of a thin but rigid, plastic shell mounted in a foam block. The shell extends to the axilla laterally and to Tl posteriorly. The system often includes anterior support just under the clavicles and some form of head control. The orthotic systems are custom fabricated and are designed to: (1) support the lumbar and thoracic spine to reduce the size and progression of kyphotic and scoliotic curves, (2) securely position the patient in a posture which reduces the incidence and strength of spastic reflexes, (3) control sitting surface pressure distribution, and (4) resist the action of spastic hip adductors.

The Sitting Support Orthosis is designed and fabricated as the central component in a system which includes wheel chair, lap board, and communication system. One hundred sixteen orthoses have been fitted during the past three years with excellent acceptance by patients, parents, and others who teach or care for these children.

DURING THE PAST three years, the Orthotic and Prosthetic Laboratory at Gillette Children's Hospital has developed a sitting support orthosis which has become very important in the treatment of the non-ambulatory child with severe cerebral palsy or advanced Duchenne muscular dystrophy. The Gillette Rehabilitation Therapy Department has also been very actively involved in the development and use of the sitting support orthosis. Their knowledge of the problems associated with cerebral palsy has ensured that the orthosis not only addresses these problems but is compatible with the complementary to the rest of the child's adaptive equipment and his daily routine. Specific problems of concern are those of feeding, communication, reflex patterns, abnormal muscle tone, and learning potential in addition to spinal deformity. The medical staff of our cerebral palsy service, our spine service, and our growth and development service has provided the impetus, encouragement and support for the project (Figure 1).



Fig. 1 — The "Gillette" Sitting Support Orthosis with anterior thoracic support and head support.

*Gillette Hospital, St. Paul, Minnesota

†Director of Medical Education and Chief, Spine Service, Gillette Children's Hospital, St. Paul and Professor of Orthopedics, University of Minnesota Hospitals.

See Editorial Page 499.

Background and History

The development began on our cerebral palsy service. Most cerebral palsy children who do not acquire the ability to ambulate, lack the balance or voluntary means to have a good sitting posture in their first decade of life. They sit in a kyphotic or kyphoscoliotic posture. The pelvis is often not horizontal. In some cases, balance, voluntary control, and sitting posture improve rapidly enough so that the flexible spine deformity of the first decade dose *not* become a rigid, progressive deformity during the second decade. However, a significant portion of non-ambulatory cerebral palsy children *do* progress during the second decade to a serious spinal deformity. The spine curvature may make sitting very difficult or eventually even impossible. A hip can dislocate and become quite painful due to fixed pelvic obliquity. Cardiopulmonary function may be seriously compromised. Another important consideration is that a small but significant portion of these patients have an average or superior intelligence. Their education, social interaction and self-esteem are very important and greatly affected by their sitting posture and function.

The child with Duchenne muscular dystrophy begins to develop his spinal deformity about the time he becomes non-ambulatory. The deformity progresses to become a very large single curve. The deformity includes rotation, scoliosis, and either kyphosis or lordosis. The spine deformity sometimes affects cardio-pulmonary function and almost always creates a sitting posture so poor that the patient's function is seriously compromised. This happens long before the patient would lose this function because of other manifestations of the disease.

Our approach on seating in the past had been to utilize the hospital's carpentry shop to construct wedged seats with upholstered lateral supports. This approach is very common around the country and is successful to some degree. However, it does not adequately control the location and orientation of the pelvis. Lack of contoured conformance to the anatomy results in a concentration of the pressures generated by gravity and supports. The padded, upholstered sides of the seat were too bulky to extend lateral thoracic support very high in the sub-axillary area. Even the best of these seats accomplished very little in the way of real spine support.

Spinal Orthoses

The body jacket type orthosis is able to exert quite strong (though not always successful) control of the spine and is typically used to control spinal deformities in cerebral palsy (Figure 2). However, this orthosis represents a major impact on the patient and his family. It obviously steals some of the patient's motion and mobility. It must be applied very carefully, and the



Fig. 2 — The two-piece Body Jacket type Orthosis on a teenage boy with severe Cerebral Palsy.



Fig. 3 — A Milwaukee Orthosis on a child with severe Cerebral Palsy.

skin must be monitored faithfully. Although it supports the torso completely, it does so as a unit. This unit still must receive external support to maintain proper sitting posture. In our experience, the child with advanced Duchenne muscular dystrophy will not tolerate the body jacket type orthosis. He and his family are reluctant to work through the initial period of discomfort for him. More important, he will not give up the upper thoracic motion which helps him greatly with hand placement and elbow control.



Fig. 4 — The polypropylene shell mounted in a polyethylene foam block.



Fig. 5 — The rigid, molded, anterior support for reducing kyphotic sitting postures. Pressure is concentrated in the immediate subclavicular area.

The Milwaukee orthosis is also capable of exerting strong controlling forces on the spine (Figure 3). However, it becomes a serious irritant for any patient not having the voluntary control to be able to withdraw from contact with the neck ring. Also, the neck ring is a hazard in some patients, because it does not permit them to position their head to best see what their hands are doing. The advanced Duchenne muscular dystrophy patient requires all his available head motion for self-feeding.

Gillette Sitting Support Orthosis

The sitting support orthosis developed here at Gillette consists of a custom-molded, plastic shell mounted on a base (Figure 4). The plastic shell is fabricated by vacuum forming hot polypropylene sheet material over a positive plaster model of the child's posterior and lateral surfaces. Thus, the plastic shell conforms to the body contours posteriorly and laterally from the knees to the upper thorax. The base provides the proper support to the shell and allows the unit to be removed from the wheel chair for use in the car or other places. A lap belt is provided to hold the pelvis snugly back into position. The hips are positioned in the amount of flexion recommended by the physical or occupational therapist. Reflex patterns in severe cerebral palsy are frequently affected by the degree of hip flexion so we follow the recommendation of the occupational or physical therapist in this regard. These children also very often have overactive hip adductors. The pommel prevents excessive hip adduction, and it also helps to prevent the patient from sliding out of the seat. In the case of muscular dystrophy patients, the hips are positioned as close to 90° of flexion as possible. The pommel is usually not necessary and is eliminated in favor of easier usage of the urinal.

Various anterior components are added as necessary. A lordotic muscular dystrophy patient will need a large abdomino-thoracic apron to pull him upright. For the kyphotic patient, a fabric halter or rigid, custom-contoured, subclavicular support (Figure 5) may be necessary, depending on the force required to obtain an acceptable posture. Stabilizing the thorax obviously aids the patient's voluntary head control, but sometimes additional head support is necessary (Figure 6). In some cases, head control is used continuously to prevent certain head positions and the

reflex patterns which are triggered by those positions. In other cases, it is appropriate to make the head support removable so that it may be used part-time only or for feeding. This is another aspect of the design which requires consultation with an experienced therapist who has had a chance to become acquainted with the child.

The exact angle of recline is not decided until fitting the orthosis to the child. We try to bring the child as nearly as practical to a vertical sitting position.

The thin plastic shell design permits us to extend our lateral thoracic support right up to the axilla without impinging uncomfortably on the medial aspect of the arm. This support eliminates most of the collapsing action of gravity.

When the child wishes to roll around and play on the floor, supporting hardware is automatically left behind in the chair. He is free to roll or scoot around unencumbered. When the child is horizontal, gravity is not operating to collapse the spine.

Results

As of this date, we have fitted 116 sitting support orthoses on ninety-seven patients. Ninety-eight were for children with cerebral palsy, and eighteen were for children with advanced Duchenne muscular dystrophy.

How effective this approach will be in reducing the progression of spine deformities during the growth



Fig. 7 — Child with severe Cerebral Palsy assuming a typical unsupported sitting posture.



Fig. 6 — Finished Sitting Support Orthosis with head support.



Fig. 8 — Child of Figure 7, now in his Sitting Support Orthosis.

years will require several more years of observation and study.

At this time, the sitting support orthosis has been very successful in several ways. The system has proven capable of providing the stabilizing support necessary for a near-normal sitting posture (Figures 7 and 8). Head control or position is usually improved, sometimes dramatically. Better head control, whether it comes indirectly through stabilization of the thorax or directly by head support, is extremely important. A child who is chronically looking straight down or straight up or sideways at the world is deprived of normal avenues of discovery, stimulation, and social interaction.

The orthosis usually improves the child's comfort and position to the point that the intensity of reflex patterns and abnormal muscle tone are reduced. Stability provided by the sitting support orthosis frees up the child's hands in some cases where they would otherwise be used for support. This also means the child does not have to try to pay attention to so many things and can better concentrate on such things as head control, communicating, or learning in the classroom. The orthosis has also greatly improved or simplified the sometimes very difficult task of feeding these children.

Discussion

The sitting support orthosis must fit quite closely to be effective. The child will not fit in his orthosis when bundled up in heavy winter clothing. Sometimes it is advisable for the child to be in his orthosis during schoolbus rides, and the temperature may be quite low. The orthosis can be accommodated under a winter coat by using a larger size or making simple adaptations. The orthosis is outgrown usually between eleven and twenty-five months after fitting.

The involvement and cooperation of the entire health team creates an overall equipment system which works. It works because the various components are compatible, and the important problems in the child's life are recognized and dealt with. Figure 9 is a photograph of a child with cerebral palsy and his sitting support orthosis, wheel chair, and lap board with in-laid communication figures.

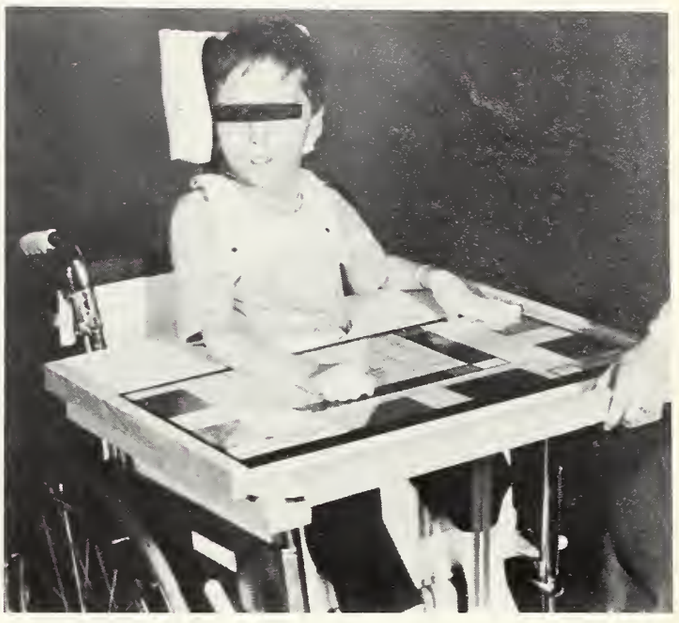


Fig. 9 — Child in his wheel chair with Sitting Support Orthosis, lap board, and communication system.

Our most enthusiastic response and encouragement has come from the parents, teachers, therapists, nurses, and other people who teach or care for the child in the community. These people who live or work with the children on a daily basis know better than anyone the current effect of treatment on the total child.

Acknowledgments

The authors wish to acknowledge the important contributions to this development made by: Fran Hollerbach, Mary Hartung, Scott Webber, Gene Berglund, Arturo Vazquez Vela, and other orthotic and prosthetic laboratory staff members; Jan Headly, Rehabilitation Director; Diane Twedt, Rehabilitation Therapy Supervisor; Karen Beck, Martha Talmadge, Marilyn Kochsiek, Sue Swanson, Collette Carlson, and Lee Schuveiller, Rehabilitation Therapy staff members; Dr. Thomas Comfort, Dr. Lowell Lutter, and Dr. John Lonstein, Gillette orthopedic staff members; and Dr. Richard Zarling, neurologist, Fairview Hospital.

Continuing Medical Education

Third National Conference on "The Impaired Physician" will be held September 29-October 1, at the Sheraton Ritz Hotel, Minneapolis. Special brochures being mailed by the Minnesota Medical Association to all physicians.

Conference sponsored by the American Medical Association and the Minnesota Medical Association.

Radiographic Evaluation of the Scoliotic Patient

DAVID H. BINSTADT, M.D.*; JOHN E. LONSTEIN, M.D.†; and ROBERT B. WINTER, M.D.#

The purpose of this article is to describe the radiographic evaluation of the scoliotic patient as performed at Gillette Children's Hospital. Increasing awareness of spinal curvature problems by the general practitioner and pediatrician, coupled with routine school screening programs, have resulted in earlier detection of this particular problem. Thorough radiographic evaluation of the scoliotic patient plays a major role in the diagnosis, management, and follow-up of the patient with a spinal deformity.

ETIOLOGIES ARE many and diverse (Table 1), but the idiopathic group is the most frequently encountered form of scoliosis. In a certain percentage of these patients, progression can occur, leading to severe spinal deformities. Early detection and evaluation will

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TABLE 1
Classification of Scoliosis by Etiology
According to Goldstein and Waugh[4]

- I. Idiopathic
  - A. Infantile (0-3 years)
    - 1. Resolving
    - 2. Progressive
  - B. Juvenile (3-10 years)
  - C. Adolescent (Greater than 10 years)
- II. Neuromuscular
  - A. Neuropathic
    - 1. Upper motor neuron
      - a. Cerebral palsy
      - b. Spinocerebellar degeneration
      - c. Syringomyelia
      - d. Spinal cord tumor
      - e. Spinal cord trauma
      - f. Other
    - 2. Lower motor neuron
      - a. Poliomyelitis
      - b. Other viral myelitides
      - c. Traumatic
      - d. Spinal muscular atrophy
      - e. Myelomeningocele (paralytic)
    - 3. Dysautonomia (Riley-Day)
    - 4. Other
  - B. Myopathic
    - 1. Arthrogryposis
    - 2. Muscular dystrophy
      - a. Duchenne (Pseudohypertrophic)
      - b. Limb-girdle
      - c. Facial-scapulo-humeral
    - 3. Fiber type disproportion
    - 4. Congenital hypotonia
    - 5. Myotonia Dystrophica
    - 6. Other
- III. Congenital
  - A. Failure of formation
    - 1. Wedge vertebra
    - 2. Hemivertebra
  - B. Failure of segmentation
    - 1. Unilateral (unsegmented bar)
    - 2. Bilateral
  - C. Mixed
- IV. Neurofibromatosis
- V. Mesenchymal Disorders
  - A. Marfan's
  - B. Ehlers-Danlos
  - C. Others
- VI. Rheumatoid disease
- VII. Trauma
  - A. Fracture
  - B. Surgical
    - 1. Post laminectomy
    - 2. Post thoracoplasty
  - C. Irradiation
- VIII. Extraspinal Contractures
  - A. Postempyema
  - B. Post burns
- IX. Osteochondrodystrophies
  - A. Diastrophic dwarfism
  - B. Mucopolysaccharidoses (eg. Morquio's)
  - C. Spondyloepiphyseal dysplasia
  - D. Multiple epiphyseal dysplasia
  - E. Other
- X. Infection of bone
  - A. Acute
  - B. Chronic
- XI. Metabolic disorders
  - A. Rickets
  - B. Osteogenesis imperfecta
  - C. Homocystinuria
  - D. Others
- XII. Related to lumbosacral joint
  - A. Spondylolysis and spondylolisthesis
  - B. Congenital anomalies of lumbosacral region
- XIII. Tumors
  - A. Vertebral column
    - 1. Osteoid osteoma
    - 2. Histiocytosis X
    - 3. Other
  - B. Spinal cord (see neuromuscular)

permit early conservative management by bracing, thereby obviating surgical intervention.

The location of the spinal curvature apex determines the anatomical area of spinal involvement. Based upon this, we have listed in Table 2 the commonly encountered curve types.

TABLE 2
Classification by Anatomic Area

Cervical	**Apex between C1 and C6**
Cervicothoracic	**Apex between C7 and T1**
Thoracic	**Apex between T1 and T11**
Thoracolumbar	**Apex between T12 and L1**
Lumbar	**Apex between L2 and L4**
Lumbar Sacral	**Apex between L5-S1**

Curve Measurement

The Scoliosis Research Society has adopted the Cobb method for the measurement of scoliosis.[2] The end or transitional vertebrae are those that are maximally tilted into the concave aspect of the curvature. Perpendicular lines drawn from the superior end plate of the upper vertebra and inferior plate of the lower vertebra are constructed and the angle of intersection determines the curvature (Figure 1). The same method is employed for measuring the curves on the side bending views. The same principles apply for measuring the degree of kyphosis; the end vertebrae are those most tilted from the horizontal, and perpendicular lines are constructed and the intersecting angle represents the degree of kyphosis. These same measurements are obtained with the flexion and hyperextension lateral views using the same vertebrae as reference points. It is imperative that subsequent curve measurements utilize these same end vertebrae.

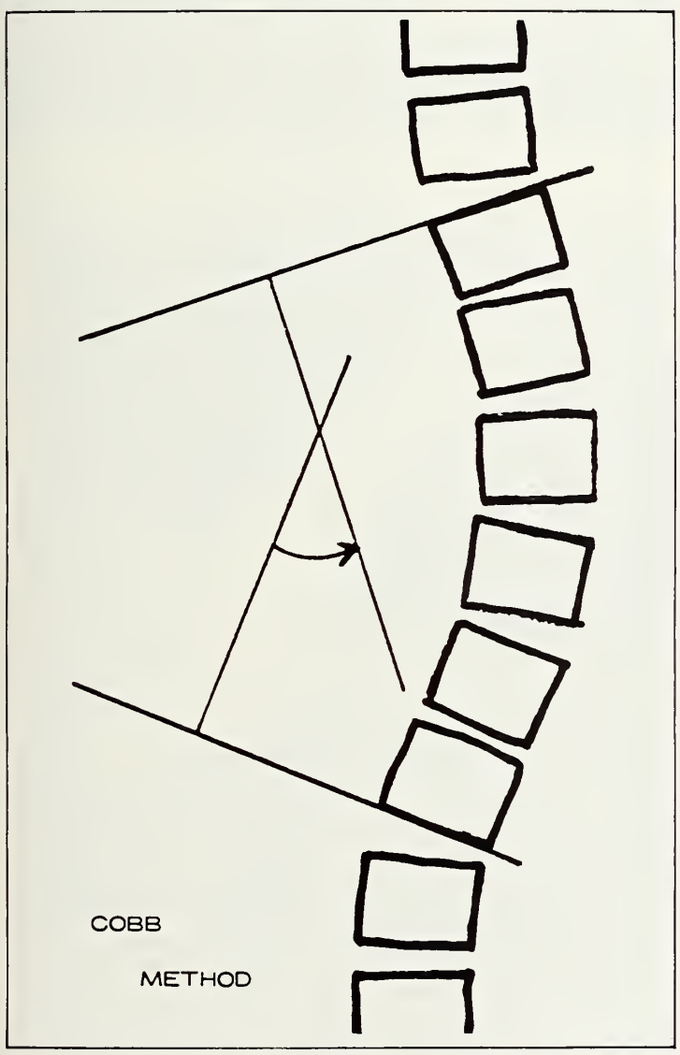


Fig. 1 — Diagrammatic representation utilizing the Cobb method for the determination of scoliosis. Perpendicular line drawn from the superior end plate of the upper vertebrae (the one whose superior surface tilts to concavity of the curve) and perpendicular line drawn from the inferior plate of the lower vertebrae (vertebrae whose inferior surface tilts to concavity of curve) are constructed and the angle of intersection determines the curvature.

Material and Methods

In young children the entire spine and pelvis can be

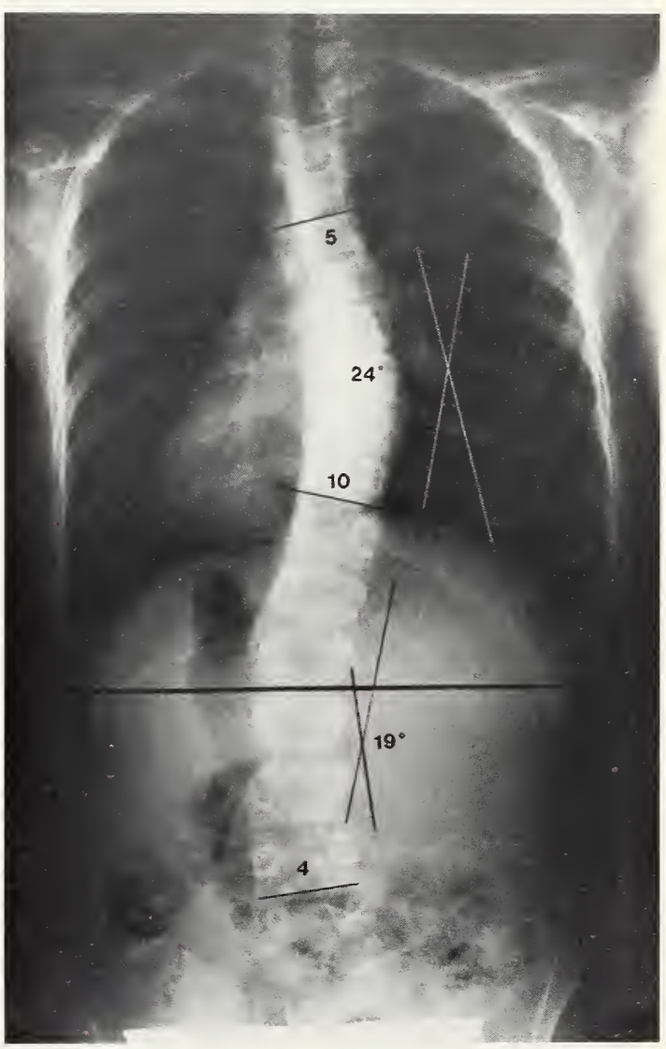


Fig. 2A—AP roentgenogram obtained on 14 x 36 inch film at 2 meter distance utilizing the gonadal shielding in the AP projection. Determination of the thoracic and lumbar curves is shown. Note the excellent visualization of the entire spine on the lateral radiograph (Figure 2B).

evaluated properly on a 14 x 17 inch film in the AP and lateral projections in the sitting or standing positions. The lateral standing roentgenogram should include the entire spine with good visualization of the upper thoracic and lumbosacral region. In older children and young adults, 14 x 36 inch films are used (Figures 2A and 2B). When possible, gonadal shielding is utilized. If there is no evidence of scoliosis, additional roentgenograms are not necessary. However, in the presence of scoliosis, maximal supine right and left active side bending roentgenograms are obtained to determine whether or not the curve is structured or non structured (Figures 3A and 3B).

The x-ray technician must be certain that the patient is properly positioned with equal weight bearing in the lower extremities and knees straight to ensure the best posture. The upper extremities are placed horizontally on an adjustable bar at shoulder level (Figures 4A and



Fig. 2B — Lateral roentgenogram. (See Figure 2A).



Fig. 3A—Right bending view on the patient illustrated in Figure 2A revealing reduction of scoliosis from 24° to 3° with this maneuver.

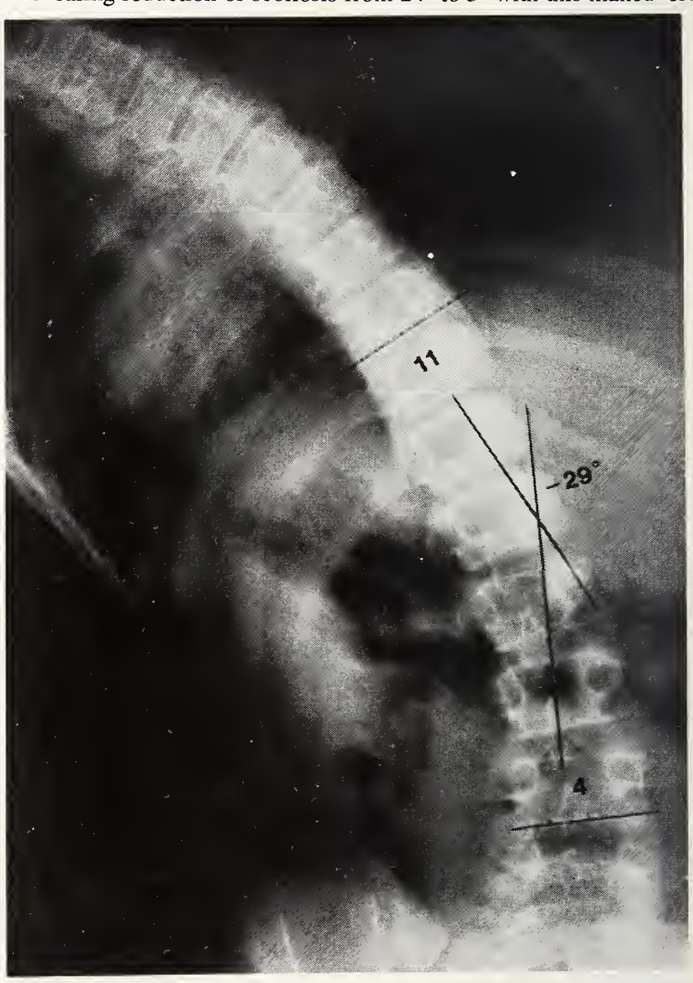
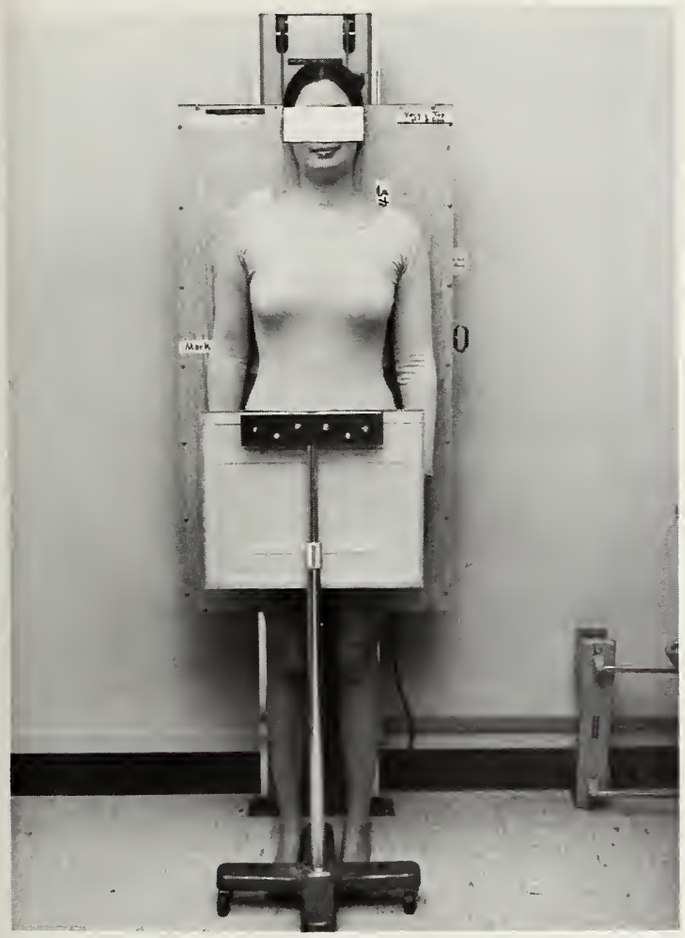
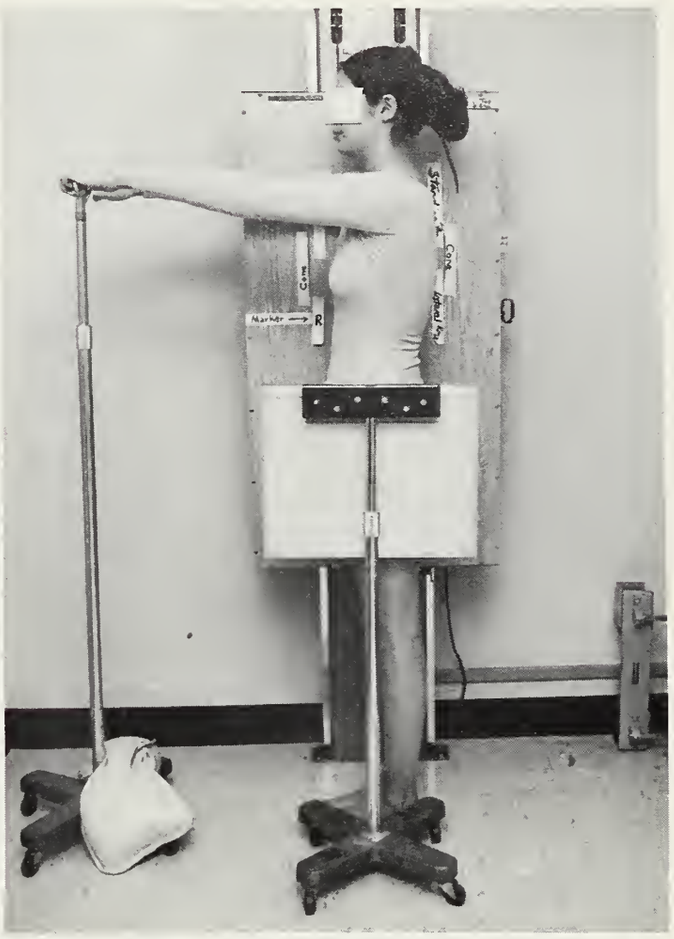


Fig. 3B—The left bending view on this same patient reveals over correction of the lumbar curve indicating that this is a nonstructured scoliosis in the lumbar region.





Figs. 4A (left) and 4B (right) — Proper positions in the AP and lateral views for the obtainment of 2 meter AP and lateral standing roentgenograms of the spine. Note equal weight bearing in the lower extremities with straight knees and, in the lateral projection, the horizontal position of the upper extremities on an adjustable bar at shoulder level.

4B). The use of an aluminum wedge filter will assist one in visualizing difficult areas by allowing more uniform exposure.

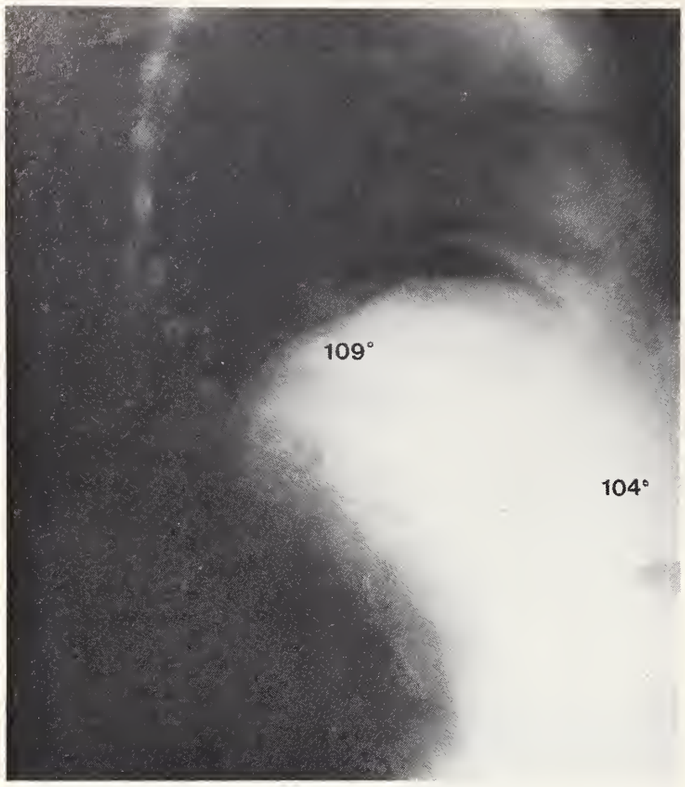
Further roentgenograms may be necessary, depending upon the patient's individual problem and the diagnosis. For example, if there is an associated kyphosis, a hyperextension lateral roentgenogram is obtained with the patient lying supine on a round plastic block in the region of the maximal kyphosis (Figure 5). This allows one to evaluate the degree of rigidity of the kyphotic area. Similarly, a hyperflexion supine lateral spine is obtained in patients with lordosis.

Patients with congenital scoliosis often require tomographic evaluation of the involved area to make a more accurate assessment of the particular problem (Figures 6A and 6B). If there is an associated neurological impairment, skin abnormality, or dysraphic spine, large volume myelography is mandatory.[3] An intravenous pyelogram is necessary in all patients with congenital scoliosis in view of the rather high association of genitourinary anomalies[4] (Figure 7).

Recently, additional diagnostic modalities have



Fig. 5—The arrow marks the region of maximal kyphosis, and with the patient supine a hyperextension lateral roentgenogram is obtained for evaluation of the kyphotic region.



been introduced that can assist one in arriving at a specific diagnosis in the scoliotic patient. For example, nuclear bone scans are quite valuable in the patient with a suspected spinal osteoid osteoma. These vascular lesions will show increased activity on the nuclear bone scans (Figure 8). The use of computed axial tomography, although primarily in its investigational stage at this time, will no doubt play a major role in the near future for the evaluation of vertebral abnormalities, such as spinal dysraphism, spinal stenosis, syringomyelia, diastrmatomyelia, and other specific spinal problems.[5,6,7]

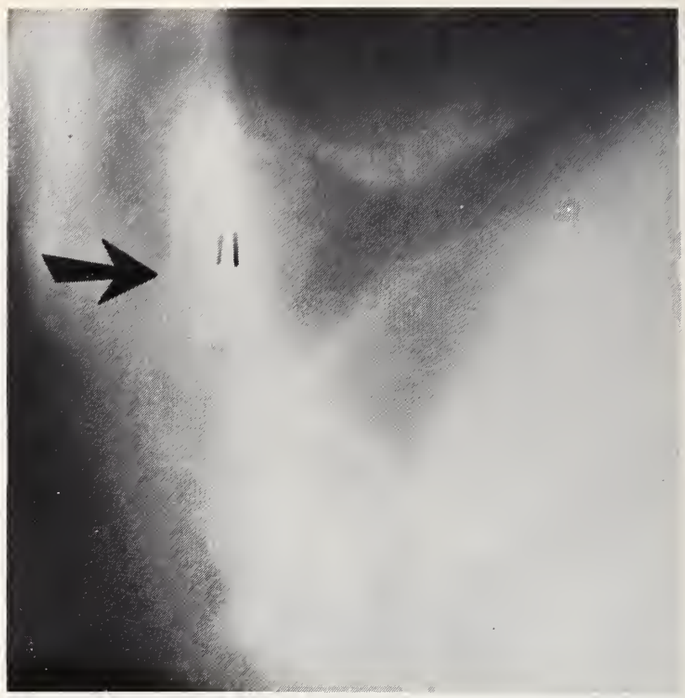
Summary

The radiographic evaluation of a spinal deformity is the most valuable diagnostic tool available to the orthopedic surgeon. With the assistance of roentgenograms and other modalities as discussed above, the diagnosis as to the etiology and type of spinal deformity can be made. The ''standard'' radiographic technique that has been described will ensure uniform evaluation of the scoliotic patient and allow valid comparison in the future follow-up. Proper documentation of the spinal curve allows the orthopedic surgeon to determine the site, magnitude, and flexibility of the spine and play an important role in the future management of the scoliotic patient.

Acknowledgments

We want to express our sincere appreciation to Lyn Hassell for preparation of the manuscript and to the Gillette Children's Hospital photography department for the illustrations.

References will be found on page 496.



Figs. 6A (left) and 6B (right) (6A) — This overpenetrated roentgenogram does not allow one to adeqately visualize the spine. (6B) Coned-down lateral tomogram reveals a posteriorly-positioned hypoplastic T11 vertebral body at arrow site. This abnormality had not been appreciated on previous ''routine'' standing spine films.

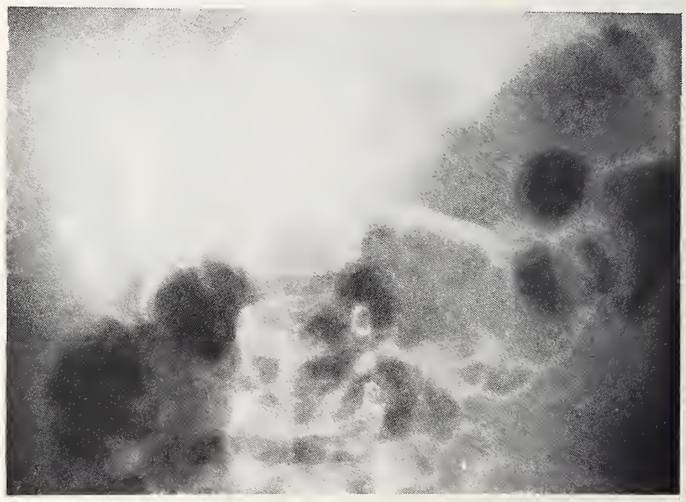


Fig. 7—Twenty minute film from an intravenous pyelogram revealing duplication of the right upper collecting system. Other genitourinary abnormalities can also be seen in the scoliotic patient.

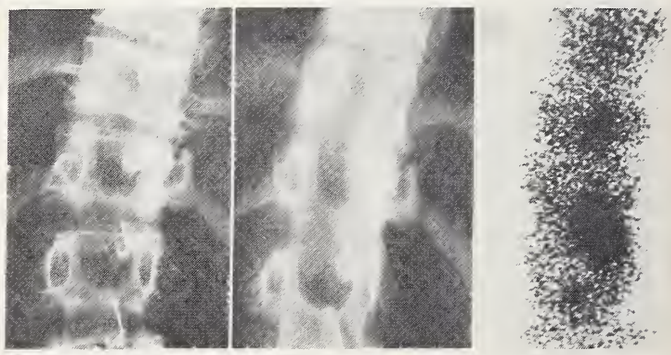


Fig. 8—From the reader's left to right are shown plain film, tomogram, and nuclear bone scan in a patient with an osteoid osteoma. The tomogram confirms the suspicious appearing T12 pedicle on the patient's left side, and the nuclear bone scan shows increased uptake in this region, substantiating the diagnosis of osteoid osteoma.

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Flexor Carpi Ulnaris and the Brachioradialis as a Wrist Extension Transfer in Cerebral Palsy

Comparison

JAMES H. HOUSE, M.D.* and FRANK W. GWATHMEY, M.D.†

There are several alternative surgical methods of correcting the flexion-ulnar deviation deformity of the wrist in children with cerebral palsy.

The flexor carpi ulnaris and brachioradialis are often used as a tendon transfer to augment wrist extension. The selection of transfer and the functional results of surgery in a series of fifty-four patients is reviewed and a comparison of the active range of motion achieved by the transfer of these muscles is presented.

THE POSITION of the wrist joint is of utmost importance in the function of the hand. In cerebral palsy there is commonly an imbalance of the flexor and extensor forces resulting in marked wrist flexion and ulnar deviation because of the predominance of the flexor forces (Figures 1 and 2). This causes a substantial diminution in the power and effectiveness of grasp. The extensors are chronically overstretched and weakened so that they are incapable of balancing the spastic flexors. Wrist arthrodesis can position the wrist adequately but the loss of motion often makes the

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Fig. 1 — Patient — Age 13: A flexion ulnar deviation deformity is present and grasp is ineffective because of inadequate wrist extension for stabilization.



Fig. 2 — The wrist flexion posture commonly persists and may facilitate finger extension in the presence of spastic digital flexors.

hand even more inefficient because of the loss of automatic tenodesis provided by wrist extension and flexion. Furthermore, a tenodesis that maintains an extensor habitus or a spastic tendon transfer that excessively extends the wrist may improve strength of grasp but may make spastic finger flexors so tight that the hand cannot be opened voluntarily. When surgery is elected to improve function, a carefully individualized selection of procedures is essential.

Wrist extension can be augmented by the transfer of a tendon with a functioning motor of suitable strength and excursion (Figures 3,4,5,6). The fact that the transfer may be spastic is not necessarily a contraindication to the transfer. Green in 1962, proposed the transfer of the flexor carpi ulnaris to the radial wrist extensors. This has two effects; it removes a flexor and ulnarly deviating force and also provides augmentation for wrist extension and supination. McCue has reported good results following transfer of the brachioradialis to the radial wrist extensors. Other transfers that have been used in certain instances are the flexor carpi radialis, the flexor digitorum superficialis, and the radial transfer of the extensor carpi ulnaris.[3,6] All of these transfers are predicated on obtaining a suitable balance of digital and wrist flexor forces by flexor slide, tendon lengthening or tenotomy.

Review of Series - (Table 1)

This report reviews the experience of tendon transfer of the flexor carpi ulnaris or the brachioradialis for wrist extension augmentation in fifty-four cerebral palsy patients (Figures 3 and 4). These patients are part of a series of seventy-six patients, who have had various hand procedures from a total population of approximately 750 cerebral palsy patients at Gillette Children's Hospital during the period 1967 to 1975. Associated procedures are listed in Table 2. The flexor carpi ulnaris was used frequently in the early part of the series whereas the brachioradialis was selected more often later because of the observation that an extensor habitus of the wrist occasionally followed transfer of the flexor carpi ulnaris in younger patients. The "extensor habitus", or inability to actively flex the wrist, apparently resulted either from the inability of

TABLE 1

Number of Patients			**54**
Males	**35**	**Females**	**19**
L Hand	**20**	**R Hand**	**34**
Mean Age at Surgery			**13.6**
Range	**4 - 19**		
Mean IQ			**75**
Range	**30 - 119**		

TABLE 2

Associated Procedures

Thumb Rebalancing	**39**
PT Release	**39**
Flexor Origin Slide	**8**
Elbow or Wrist Release	**9**



Fig. 3 — The brachioradialis has been divided and mobilized in preparation for transfer to the extensor carpi radialis brevis.



Fig. 4 — The brachioradialis tendon is interwoven into the extensor carpi radialis brevis at its musculotendon junction to augment wrist extension.



Fig. 5 — Following surgery, wrist extension has improved and the hand assumes a more functional position. Additional surgery has also improved abduction and extension of the thumb.

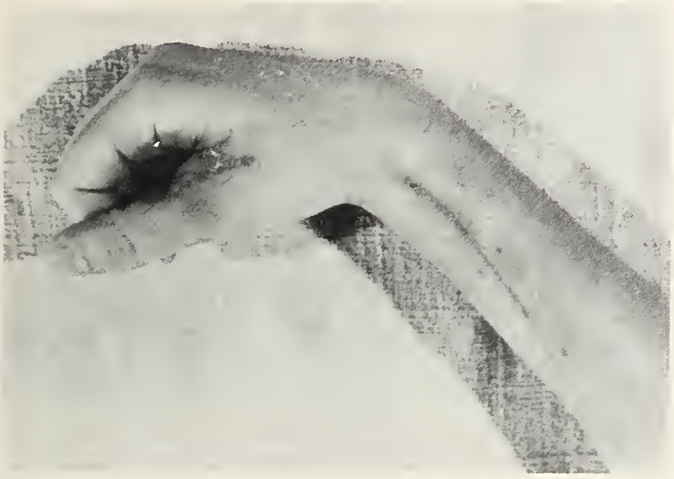


Fig. 6 — Active flexion is maintained and overall function has improved as a result of better muscle balance.

the spastic flexor carpi ulnaris to physically relax or due to tenodesis along the course of the transverse tendon.

Results

Results were based on the ability of the transfer to *actively extend* the wrist from a position of flexion. For a transfer to be classified *good* it had to move the wrist to thirty degrees or more of extension. A *fair* result represented movement to a position of at least fifteen degrees of extension. A *poor* result was one with less motion than this, a tenodesed transfer or an extensor habitus with loss of active flexion. The results are summarized in Table 3. Twenty-five of thirty-two flexor carpi ulnaris transfers produced good or fair results whereas nineteen of twenty-two brachioradialis transfers were rated good or fair.

TABLE 3
Wrist Extension Transfers

		Results of Procedure		
	No.	Good	Fair	Poor
FCU→ECRB	19	9	5	5
FCU→ECRL	13	6	6	1
BR→ECRB	17	11	4	2
BR→ECRL	5	3	1	1

There were six poor results of flexor carpi ulnaris transfers. Two transfers into the extensor carpi radialis longus caused radial deviation deformities. One was to such a degree that it necessitated a revision of the transfer. After reinsertion into the base of the fourth metacarpal, a good result was produced. Four poor results were secondary to overly spastic muscles that functioned primarily as a tenodesis producing limited active motion and an extensor habitus. One patient had inadequate flexor carpi ulnaris power to extend the wrist but a satisfactory result was produced by adding the brachioradialis.

Brachioradialis transfers produced three poor results, two to the extensor carpi radialis brevis and one to the extensor carpi radialis longus. One was because of an unsatisfactory tenodesis effect. The other two did not have sufficient power to maintain extension, and in the absence of other muscles for transfer, required wrist arthrodesis to provide stabilization.

Discussion

The brachioradialis and the flexor carpi ulnaris have similar power and amplitudes of excursion, providing the brachioradialis is released from its investing fascia.[1,5] The flexor carpi ulnaris is the most important wrist flexor and it is desirable to preserve this function if possible. The brachioradialis often retains adequate voluntary control and after transfer for wrist extension augmentation, it crosses both the elbow and the wrist joint and thereby acquires a multiplier effect from elbow motion.

The functional expectations of tendon transfers in cerebral palsy depend upon a number of variables, and often a compromise is required in order to obtain a balance of wrist position for satisfactory function. A careful analysis of the balance and control encountered in each patient is necessary for selection of the proper motor for transfer. If the flexor carpi ulnaris causes marked wrist flexion that cannot be passively corrected, it must either be lengthened or transferred. It may not be suitable as an active extensor transfer because of its spasticity, and at best it will probably provide only a wrist extension tenodesis. However, an extended wrist is generally more functional than a flexed one and this may be a realistic goal for the particular patient. If on the other hand, passive correction can be obtained and the flexor carpi ulnaris exhibits good voluntary control, it would be expected to function well as an extensor transfer however, its removal would significantly weaken flexion. The brachioradialis is probably the best motor to select when augmentation of wrist extension is all that is required to provide balance of the wrist. Tenotomy or lengthening of the flexor carpi ulnaris may be required in conjunction with brachioradialis transfer because of chronic contracture. If the flexor carpi ulnaris is functional, the use of the brachioradialis for wrist extension would then leave the flexor carpi radialis free to be used as a thumb abduction-extension motor, if necessary, and still preserve wrist flexion control. Particular attention must be given to the consequence of removing the flexor carpi ulnaris as a wrist flexor to

avoid the extensor habitus, and it should not be transferred if the flexor carpi radialis has been used or there are plans for its use.

Summary

The selection of the brachioradialis or the flexor carpi ulnaris as a tendon transfer for wrist extension in cerebral palsy is discussed. The results of fifty-four patients with extensor transfers are reviewed with respect to the improvement in voluntary wrist extension. Although there were nine patients with poor results of tendon transfers because of limited active range of motion, *all* but one were functionally improved when compared with their preoperative status. Either muscle may be used for transfer to improve wrist extension with satisfactory results if the forces about the wrist are carefully analyzed in each patient. The transfer should be inserted into the extensor carpi radialis brevis if wrist extension is all that is required. If there is a significant ulnar deviating imbalance, the transfer may be placed into the extensor carpi radialis longus or the extensor carpi ulnaris may be transferred more radially. The best quality of wrist control is obtained by using the brachioradialis for wrist extension augmentation suitably balanced with the flexor carpi ulnaris preserved to provide active wrist flexion.

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Continuing Medical Education
August, September

August 17 — Hibbing Medical Seminar (Internal Medicine), Hibbing General Hospital Lecture Hall. Sponsor: Physicians of Hibbing & Chisholm, Hibbing General Hospital, Range Chapter of the MAFP, U of M*. J. Chalgren, coordinator.

September 1 — Holter Monitor, St. Francis Hospital, Shakopee. Sponsor: St. Francis Hospital. 1 Prescribed hour. C. R. Heinzerling, M.D., (612) 448-2050.

September 20 — Lung Disease in Infants & Children, Holiday Inn-Capitol, St. Paul. Sponsor: Ramsey County Lung Association. 6 Prescribed hours. Edward Strem, M.D., (612) 698-0386.

September 20 — Hibbing Medical Seminar (Nephrology), Hibbing General Hospital Lecture Hall. Sponsor: Physicians of Hibbing & Chisholm, Hibbing General Hospital, Range Chapter of the MAFP, Mayo Clinic*. F. Tycast, coordinator.

*Liaison Committee on Continuing Medical Education Accredited.

Letters to the Editor

We would like to encourage physicians to contribute to the Letters to the Editor Section. We want to hear what you have to say, what you think, why you hold certain opinions. In short, we want to make this as lively and spirited a section as possible.

The Editors

Children with Short Stature

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The definition of short stature and subdivision into disproportionate and proportionate subgroups is outlined along with examples in each category. Therapeutic problems commonly encountered in the management of patients with specific disease entities are discussed along with treatment recommendations.

CONFUSION ENGENDERED by a multiplicity of common and rare disease entities causing short stature may lead to unnecessary and expensive laboratory testing, delayed and inaccurate diagnosis, and a lack of physician anticipation of commonly encountered therapeutic problems. The purpose of this paper will be to define short stature, provide guidelines for further subdivision into proportionate and disproportionate groups, and outline orthopaedic problems encountered in several specific disease entities. A detailed discussion of all short stature syndromes is out of the scope of this paper, and further information may be obtained from several reviews listed in the reference section.[2,12,18,21,23]

Short stature at birth, or intrauterine growth retardation (IGR) is defined as a birth length of 47.5 cm. or less at term.[24] Of the IGR group, approximately one-third will catch up to normal, one-third will grow at a normal rate but remain small, and one-third will fail to grow at a normal rate. Growth rate is estimated by using a standard growth chart plotting height at intervals against chronologic age. Height age may be calculated by extrapolating backwards on the growth chart from the patient's true height at present chronologic age to the median age on the chart for the patient's current height. Constitutional delay in growth implies the bone age is consistent with height age, and normal height may result from a longer growing period. Familial short stature is seen when chronologic age equals bone age. Children growing less than 5 cm. a year are below the third percentile in growth rate and deserve further evaluation (although by definition three percent will be normal). A rough guide for anticipated height at completion of growth is the average of parental height plus 2.5 cm. for a boy and minus 2.5 cm. for a girl.[3]

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Short stature in adults is currently defined as less than 145 cm. (four feet and ten inches) in women and 150 cm. (five feet) in men.[2] These individuals may be usefully subdivided into proportionate, disproportionate short trunk, and disproportionate short limb groups. In the proportionate group arm span equals height within two cm., or measurement from pubis to head equals pubis to floor. One further useful measurement is the AF/AT ratio.[5] The AT distance is measured from the anterior superior iliac spine to the tip of the middle finger with the arm extended, proportionate or normal AF/AT equals forty to fifty percent in infants and forty to sixty percent in adults. In the short limbed disproportionate group AF/AT is approximately thirty percent and in the short trunk group seventy percent. Table 1 lists the entities to be further discussed in this paper subdivided by relative proportion. A basic screen of proportionate dwarfism should include: (1) Xrays of skull epiphyses and long bones, (2) thyroid function studies, (3) serum calcium, phosphate, alkaline phosphatase, creatinine, bound urea nitrogen, hemoglobin, and urinalysis, (4) and chromosome analysis, urinary ketosteroids and human growth hormone assay may be valuable if clinically indicated. A list of syndromes to be considered in the

TABLE 1

- **I. Proportionate**
  - **A. Rickets**
  - **B. Hypopituitarism**
  - **C. Hypothyroidism**
- **II. Disproportionate**
  - **A. Short Limb**
    - **Achondroplasia**
    - **Diastrophic Dwarfism**
    - **Multiple Epiphyseal Dysplasia**
    - **Osteogenesis Imperfecta**
  - **B. Short Trunk**
    - **Spondyloepiphyseal Dysplasia**
    - **Morquio's (Mucopolysaccharidosis)**

differential diagnosis of proportionate short stature may be found in Table 2.

Rickets

Rachitic syndromes may be identified by characteristic x-ray changes in long bones, particularly at the wrist and knee. (Metaphyseal widening, lucent pseudofracture zones, and delay in appearance of ossification centers.) Normal or low serum calcium and phosphorous with an increased alkaline phosphatase are common laboratory abnormalities. A normal creatinine clearance rules out a renal component, and the patient's response to Vitamin D and calcium differentiates between the Vitamin D resistant form and simple nutritional deficiency. Malalignment in the lower extremities may be severe enough to require bracing or occasionally corrective osteotomy.

TABLE 2
Proportionate Short Stature

I. Metabolic
- A. Hypopituitarism
- B. Hypothyroidism
- C. Cushing's, including iatrogenic
- D. Von Gierke's Disease
- E. Vitamin D. Resistant and Nutritional Rickets
- F. Malabsorption

II. Genetic
- A. Turner's (XO)
- B. Down's Syndrome (Trisomy 21)
- C. Familial Short Stature

III. Organ Defects
- A. Congenital Heart Disease
- B. Respiratory Insufficiency
- C. Liver Insufficiency
- D. Severe Cerebral Defect
- E. Renal Insufficiency

IV. Miscellaneous
- A. Chronic Infection (Bronchiectasis)
- B. Collagen Disease
- C. Ulcerative Colitis
- D. Cystic Fibrosis
- E. Pyknodysostosis
- F. Malnutrition
- G. Emotional/Sensory Deprivation

Hypopituitarism

Hypopituitarism has been reported in from three to twelve percent of children evaluated for proportional growth retardation.[7] Fifty to sixty-eight percent have the idiopathic variety. The remainder have demonstrable space occupying lesions in the region of the pituitary gland, most commonly craniopharyngeoma. The presenting complaint of the idiopathic group is usually short stature or failure in development of secondary sex characteristics. Children with space occupying lesions complain of occular symptoms and may have signs of increased intracranial pressure. Failure of human growth hormone response to chemically induced stress is diagnostic, and other defects in the pituitary axis should be investigated. The sellar roentgenographic profile is abnormal in ninety percent of patients with space occupying lesions.[1] Skeletal manifestations are due to retarded bone growth, which may be improved by specific hormone replacement.

Hypothyroidism

Hypothyroidism in children may be either congenital or acquired. Prenatal hypothyroidism is implied by the absence of ossification centers about the knee and cuboid at birth.[7] Defects in the congenital group include athyroid (31%); ectopic gland (36%); dyshormonogenesis (28%).[16] The acquired group include thyroiditis, post surgical, and dietary iodine deficiency. Profound retardation of skeletal growth is the hallmark of hypothyroidism with delayed appearance in epiphyseal centers more striking than daley in linear growth. Clinical characteristics include obesity, mental retardation, dry skin, course hair, and sluggish physical activity. As a general rule, mental retardation is uncommon in most of the isolated skeletal dysplasias but is a frequent finding in skeletal dysplasias due to metabolic abnormalities. Roentgenographic findings

TABLE 3
Disproportionate

SHORT LIMB

Achondroplasia
- Narrow Interpeduncular Distance
- Epiphyses ok.
- Trident Hand

Diastrophic
- Dysplastic Hips
- Hitchhiker Thumb
- Club Feet

Multiple Epiphyseal Dysplasia
- Fragmented or Stippled Epiphyseal Centers
- Vertebrae essentially normal

Osteogenesis Imperfecta
- Osteoporosis
- Long Bone Bowing
- Multiple Fractures

SHORT TRUNK

S.E.D.
- Bi-convex Vertebrae
- Atlanto Axial Instability
- Retinal Detachment
- U A Negative

Morquio's
- ± Keratin Sulphate in Urine
- Mid Ant. Vert. Beaking
- Atlanto Axial Instability
- Severe Hip Dysplasia

include marked retardation in the appearance, and irregularity in the ossification, of the epiphyses. This finding is most marked in the hips where stippling of proximal femoral epiphyseal centers may be confused with Perthes' disease. Thyroid function studies are diagnostic.

Disproportionate Short Stature

Achondroplasia

A flow sheet breakdown of the disproportionate group may be found in Table 3. Of the disproportionate short limbed group, sixty percent are achondroplasts. Mentation is normal and inheritance is autosomal dominant. X-ray findings include narrow interpedunculate distance (may be seen in hypochondroplasia, disastrophic dwarfism, and pseudohypoparathyroidism) (Figure 1) short flarred ilia, normal epiphyses, and a narrow foramen magnum with occipitalisation of the atlas.

Significant symptoms of spinal stenosis may be seen in up to forty percent of adult achondroplasts due to the small lumbar spinal canal.[11] Compression of nerve roots may occur secondary to multiple disc herniations, degenerative spondylosis, or thoraco-lumbar kyphosis. Acute lumbar disc herniations are amenable to surgical management and present with a clinical picture similar to full statured individuals. Spinal stenosis often presents with a distinctive claudication pain pattern and may be managed surgically by extensive laminectomy. Initial symptomatic improvement may occur, but the prognosis for the return of normal function is guarded.[14] Thoraco-lumbar kyphosis is seen in the young achondroplast probably secondary to hypotonia and ligamentous laxity in addition to skeletal dysplasia. Occasionally deformity progresses requiring surgical stabilization and rarely anterior decompression for neurologic deficit. Scoliosis is seen in fifty percent of achondroplasts[8] but is generally of mild degree and seldom requires bracing or surgery.

Approximately thirty-five percent of achondroplasts have significant malalignment problems in the lower extremities. Genu varum[2] and tibia vara may cause

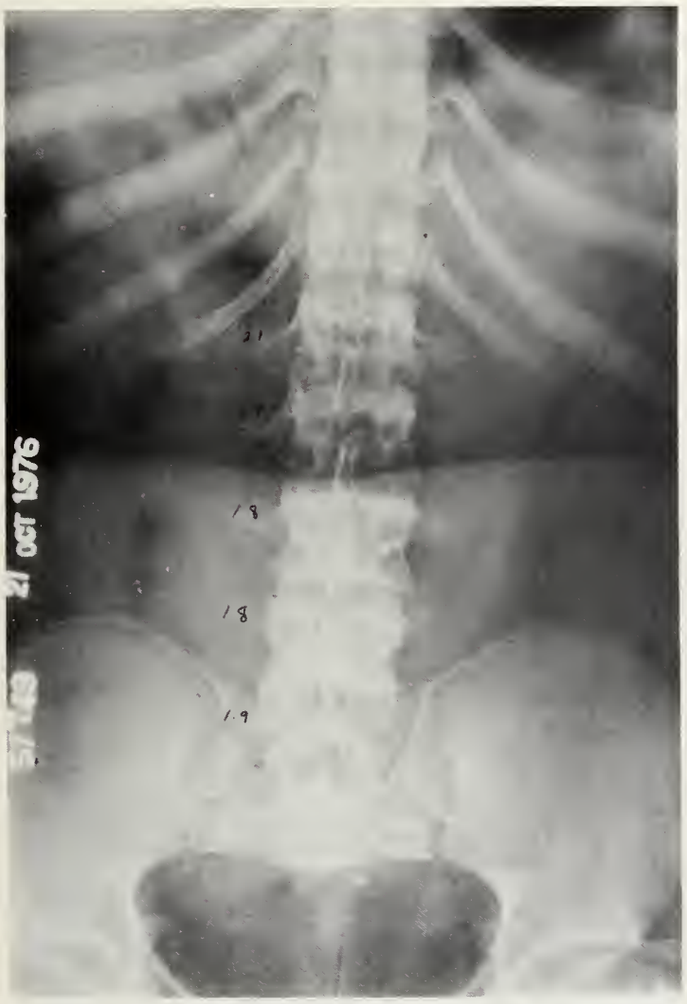


Fig. 1—The interpedunculate distance in the lumbar spine increases in normal individuals from L1 to L5. In achondroplasts the interpedunculate distance remains constant or decreases, predisposing to symptoms of spinal stenosis.

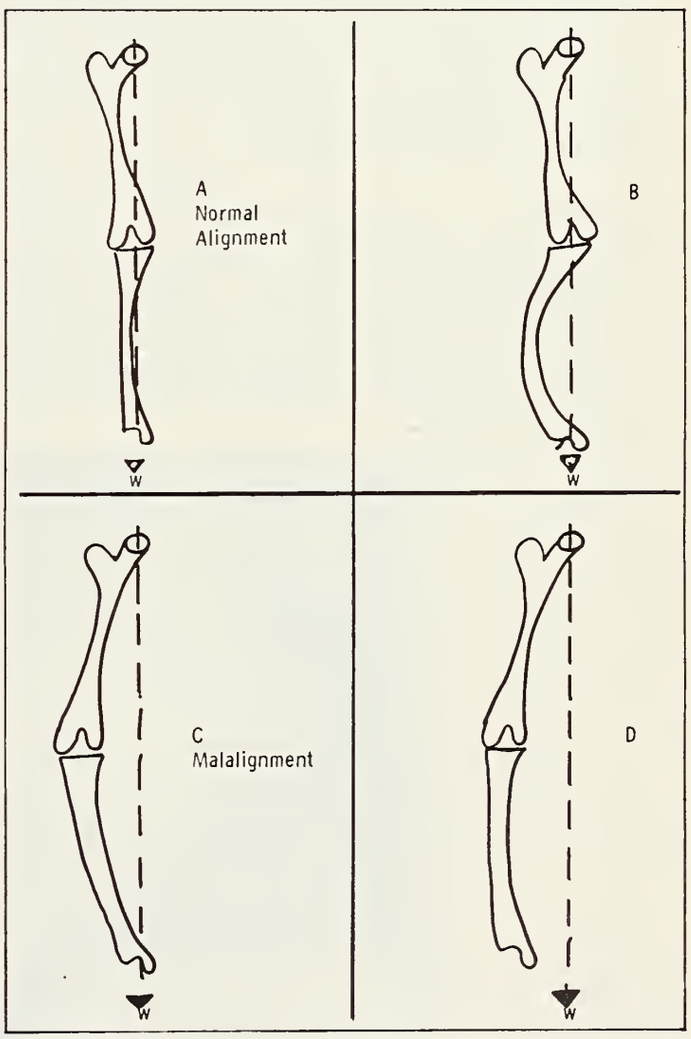


Fig. 2—Joint alignment with reference to weight bearing stress is useful in decision making when considering corrective osteotomy. When significant malalignment exists early osteoarthritis is more likely.

knee pain and lead to early osteoarthritis. Coexisting ligamentous laxity is the rule, making bracing ineffective and possibly harmful.[19] Corrective osteotomy may be indicated if the deformity is twenty degrees or more or if there is malalignment along the weight bearing line (Figure 2). Genu varum should be over corrected five to ten degrees and genu valgum under corrected five to ten degrees.

Diastrophic Dwarfism

Diastrophic dwarfism is less common than achondroplasia, but individuals are more severely involved. Clinical description includes "hitchhiker" thumbs, very resistant club feet and joint contractures; the "achondroplast with arthrogryposis". Scoliosis and/or kyphosis to a significant degree occurs in approximately thirty-five percent of patients. It is usually not present at birth or associated with congenital spinal anomalies. Early bracing (10-15° curve) or surgical management is often required. Cervical subluxation, particularly between the fourth to sixth cervical segments, may occur.[9] The resultant cervical kyphosis may cause neurologic symptoms and one case of quadriplegia has been reported.[25] Early operative stabilization is advised for progression of deformity or significant instability.

Despite marked hip dysplasia, surgery is rarely indicated. As a rule, closed reductions of hip dislocation fail, and soft tissue release is associated with considerable post operative stiffness. Knee deformity consists of flexion contracture associated with genu valgum and ligamentous instability. Surgical release or realignment is justified in approximately ten percent of patients.

Club foot deformities are particularly resistant and frequently recur after serial casting or soft tissue surgery. Bailey,[2] recommends radical soft tissue releasing procedures in the neonatal period, and if vigorous postoperative management fails to maintain a plantigrade foot, triple arthrodesis should be considered at age ten to twelve.

Multiple Epiphyseal Dysplasia

The multiple epiphyseal dysplasias present a spectrum of involvement which may vary from mild to severe in the same individual. Short stature is not prominent and most patients present with complaints of arthritic pain in the hip or knee.[20] Normal intelligence is the rule, with good muscle mass and short stubby digits. Inheritance is autosomal dominant. Roentgenographic examination discloses irregularities in the density and outline of several developing epiphyses, most commonly in the proximal femur and humerus. Vertebral osteoporosis is common and may occasionally lead to significant kyphosis or scoliosis. A fairly characteristic defect in the lateral aspect of the distal tibial epiphysis had been noted with resultant distal tibial obliquity and talar remodeling. Joint contractures at the hips, knees, elbows and shoulders are common. Coxa vara with early osteoarthritic involvement may require joint replacement arthroplasty.[22] A predeliction for osteochondritis dissecans of the knee has been reported in three individuals in the same family.[17]

Osteogenesis imperfecta (OI) presents a spectrum of skeletal involvement due to a relative failure in the production of adequate amounts of mature lamellar bone. Collagen is normal in amount and structure, but matrix production is deficient leading to an increase in bone degradation over production. Increased ligamentous laxity, heat intolerance, easy bruisability, and abnormal leukocyte metabolism suggest systemic involvement. Treatment with fluoride, androgens, magnesium and multiple systemic agents has failed to produce clinical benefit. OI may be

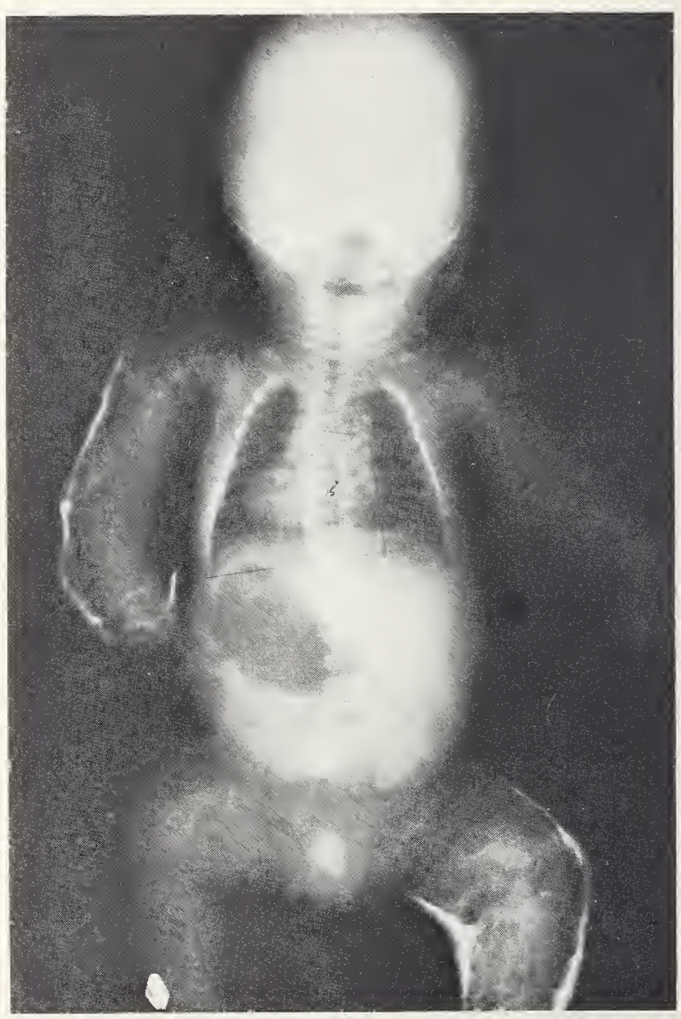


Fig. 3—Infant with severe form of osteogenesis imperfecta. Note healing intrauterine fractures as well as acute injuries under treatment.

subdivided into a congenital form (intrauterine fractures), Tarda I (long bone bowing) and Tarda II (no long bone bowing). These subdivisions are useful in indicating the severity of disease and need for surgical management.[4]

The congenital form manifests multiple fractures at birth (Figure 3), blue sclerae, dentinogenesis imperfecta, osteoporosis and bowing of bones. The congenital type has an infant mortality of greater than fifty percent, due primarily to intracranial hemorrhage and multiple respiratory infections. Those that do survive beyond two years have fewer fractures at birth and probably represent a gray zone between the congenita and Tarda I group. The congenital form and both Tarda forms are transmitted as an autosomal dominant.

Fractures are most commonly seen in the lower extremities and are usually of the transverse type of the convexity of the bow. Fracture healing is normal, but occasionally hyperabundant callous may be confused both roentgenographically and pathologically with osteosarcoma. Anterolateral bowing of the femur and lateral bowing of the tibia may require surgical treatment with multiple osteotomies and intramedullary rod fixation. Results have been generally satisfactory in relieving pain, decreasing deformity, and facilitating ambulation in selected cases. Multiple surgical procedures may be needed in the growing child and the procedure is technically demanding. The use of a telescoping rod which elongates with bone growth seems to be promising in decreasing the number of procedures required.[2]

Scoliosis has been reported in forty percent of the Tarda I and eleven percent of the Tarda II groups.[4] At Gillette Children's Hospital ten of twelve individuals with OI had significant scoliosis.[6] Application of the Milwaukee brace is limited. Curves tend to progress despite brace management but at a slower rate than if no orthosis is used. King and Bobechko,[10] reported two successful spinal fusions, but due to soft bone and poor availability of autologous graft, fusion should be delayed until skeletal maturity if possible. Low back pain is a problem in almost all adults, and compression fractures are common.

Sypondyloepiphyseal Dysplasia

The two most common entities comprising the short trunk dwarf group are spondyloepiphyseal dysplasia and Morquio's disease. The S.E.D. group may be subdivided into a more severe congenital form, several variants, and a less severe Tarda form. The bi-convex appearance of vertebral ossification centers, delay in ossification of the pubic ramus and epiphyses of long bones, coxa vara, and negative urine biochemical screening allow differentiation of S.E.D. from Morquio's. Retinal detachment occurs in fifty percent of the congenital type and may be preventable by routine slip lamp examination and early laser electrocoagulation. Inheritance is autosomal dominant and intelligence is normal.

Almost all children with S.E.D. congenita have significant atlanto-axial instability which may be due to odontoid aplasia, hypoplasia, or failure of the ossific nucleus to fuse with the body of C2, in conjunction with abnormal ligamentous laxity (Figure 4). Symptoms of spinal cord compression occur in

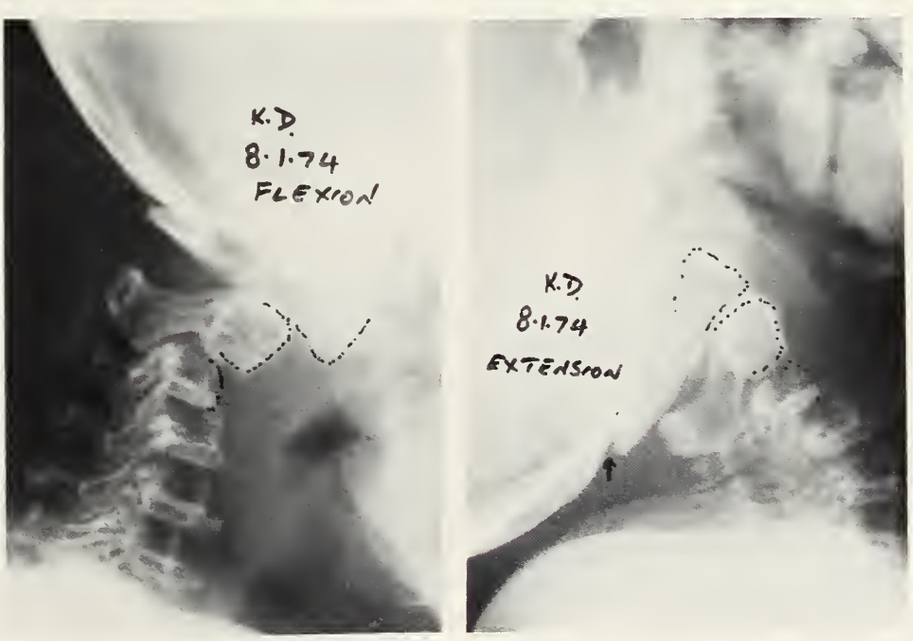


Fig. 4—Lateral flexion-extension views of the cervical spine demonstrate atlanto-axial instability. Tomograms may be required to demonstrate the odontoid, if present.

approximately one-third, varying from episodes of respiratory arrest coincident with neck flexion to an inability to achieve normal stance and gait during growth. All persons of short stature with excessive ligamentous laxity should be evaluated for cervical instability and appropriate stabilization performed before the development of permanent neurologic deficit.

Coxa vara in association with significant hip flexion contracture and increased lumbar lordosis is common. Bracing is usually not successful and, in selected cases, a valgus subtrochanteric osteotomy in conjunction with iliopsoas recession provides considerable functional benefit. Genu varum or valgum of moderate degree is seen but rarely requires surgical correction. Significant scoliosis and kyphosis are encountered in some of the S.E.D. variants. The S.E.D. Tarda group usually enjoy an uneventful childhood and present with complaints of early arthritis pain in the hips, knees, or spine. The most common mode of inheritance of the Tarda group is sex linked.

Morquio's Syndrome

Morquio's disease is the most common of the mucopolysaccharidoses and is associated with short trunk dwarfism, aortic regurgitation and normal intelligence. Keratin sulphate excretion in the urine is inconstant, particularly in older individuals, and a form of the syndrome without abnormal metabolite excretion and milder skeletal changes has been described.[15] Extreme shortness of stature, with thoracic kyphosis, pectus carinatum, genu valgum, muscular hypotonia and abnormal ligamentous laxity is common. Seventy percent of patients with odontoid dysplasia have significant atlanto-axial instability with fifty percent of those demonstrating at least transient neurologic compromise.[8] Myelopathy may become manifest by gradually decreasing endurance, a tendency towards sedentary games, or inability to walk over uneven terrain. The risk of sudden post traumatic paresis or death is considerable. Two of five individuals in Lipson's[13] series remained quadriplegic. Recovery of neurologic function following posterior cervical spine fusion is poor. Although not free of significant complications, prophylactic posterior cervical spine fusion in an asymptomatic individual with significant instability may be indicated to prevent future disaster. Ligamentous laxity, odontoid dysplasia, and thickening of the posterior longitudinal ligament secondary to abnormal mucopolysaccharide deposition predispose to myelopathy. The spine is generally severely affected, with universal vertebra plana and a characteristic mid anterior vertebral body prominence. Significant thoracic kyphosis or kyphoscoliosis may be encountered.

Bilateral hip dysplasia is the rule, producing a waddling but usually painless gait. Hip dislocation is usually not seen at birth but inadequate ossification of the acetabular roof in association with weight bearing leads to progressive subluxation, with frank dislocation and coxa valga seen in most adults. Severe genu valgum is present secondary to increased ligamentous laxity and retardation of lateral epiphyseal growth, often requiring corrective osteotomy. Restriction of elbow motion and degenerative arthritis may significantly interfere with hand use. The treatment of wrist instability by fusion has been disappointing.

Firm guidelines for the definition of short stature and subdivision into proportionate and disproportionate groups facilitate early diagnosis. Common problems should be anticipated and treated promptly so that maximal functional potential may be realized.

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Review

Congenital Hand Deformities and Their Relationship to the Spine

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In an effort to investigate the relationship of congenital hand deformities to the spine, the records of 203 patients treated on the hand service at Gillette Children's Hospital between 1950 and 1975, were reviewed. Patients with Sprengel's deformity were excluded. Information was tabulated with regard to type of upper extremity deformity, type and severity of spinal deformity, and the presence of other associated congenital anomalies. Of the 203 patients reviewed, twenty-one (10.3%) had associated hand and spine deformities. Twelve of the twenty-one (57%) have at least one other anomaly. The most common association was between congenital absence of the radius and congenital cervicothoracic scoliosis (four cases). Twelve of the twenty-one (57%) had idiopathic curve patterns, and nine (43%) had congenital curves. Even in the presence of severe upper extremity deformity, satisfactory treatment of the spine deformity was possible. Evaluation of all patients with congenital upper extremity deformity for spine deformity is recommended.

THIS STUDY WAS undertaken to investigate the frequency of spine deformity in patients with congenital hand deformities at Gillette Children's Hospital. The interest for the study was aroused in members of the hand and spine services by treating patients with both upper extremity anomalies and significant scoliosis. We attempted to answer the question, are such relationships only accidental or are they related?

Review of the Literature

The association between scoliosis and congenital upper extremity deformities has been mentioned most commonly in studies of congenital absence of the radius. In Kato's review of 250 cases,[3] five were noted to have scoliosis. Heikel[1] added 180 patients to Kato's series, and found three cases of associated scoliosis, one thoracic, one lumbar and one unspecified. In Riordan's series of eleven patients,[8] one had a hemivertebrae. In Pardini's series of thirty-nine cases,[7] congenital scoliosis was present in four. Lamb[4] refers to a review by Gillette of fifty-four cases, in which two cases of congenital scoliosis and seven cases of idiopathic scoliosis were present (18%).

Makley[6] found a "striking incidence" of scoliosis associated with radial and ulnar hemimelia, phenomalia and amelia. In patients with radial hemimelia, seven had idiopathic and two congenital scoliosis. Five of six patients with ulnar hemimelia had idiopathic scoliosis.

Material and Methods

The records of all patients age zero to twenty-one years with congenital deformities of the upper extremities treated at Gillette Children's Hospital were reviewed for the presence of spinal lesions. Once identified, their charts and roentgenograms were analyzed for the type of upper extremity deformity, type of spinal lesion, details of treatment, and the presence of other associated congenital anomalies. In this manner, the records of 203 patients were reviewed.

Results — Spine Deformities

Of the 203 patients studied, twenty-one had associated extremity and spinal deformities, for an incidence of 10.3%. Of these twenty-one patients, twelve (57%) had idiopathic curve patterns, and the remaining nine (43%) had congenital curves.† In the idiopathic group, one was classified as infantile, four as juvenile, and four as adolescent onset. An additional three patients with adolescent idiopathic curve patterns were classified as scoliosis with mental retardation or multiple congenital anomalies. Of the nine patients with congenital scoliosis, five had cervicothoracic and three had thoracic curves. One had a cervicothoracic

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†Congenital scoliosis is defined as those curves caused by visibly anomalous vertebral development, the anomalies being present at birth, but the curvature usually developing later. Idiopathic scoliosis is that condition in which there are *no* vertebral anomalies, and no paralysis or medical condition known to be associated with curvature of the spine. The child always has a straight spine at birth.

See editorial, page 499.

curve associated with Type III Klippel-Feil Syndrome. The spine deformities were significant with nine of the twenty-one patients requiring spine fusion. The data on these patients are summarized in Tables 1 and 2.

Hand Deformities

The hand deformities encountered were rather evenly distributed among the different types. The most common association was between congenital absence of the radius and congenital cervicothoracic scoliosis, where four cases were present or 13% of the total. There were another four cases of multiple upper extremity deformity: One with hypoplasia of the left arm with dislocation of the radial head, anticubital webbing, absence of the left thumb, and fusion of the fourth and fifth metacarpals, associated with infantile idiopathic scoliosis; one with syndactylism involving the absence of the right index, middle, ring and little fingers with hypoplasia of the thumb, right pectoralis major, and an adolescent idiopathic curve associated with Scheuermann's kyphosis; one with bilateral proximal radio-ulnar synostosis and a left carpal coalition (fusion trapezoid-capitate) with an idiopathic curve pattern and multiple congenital anomalies; and one with complete phocomelia on the right with partial adactylia involving four hand rays, incomplete paraxial hemimelia of the left forearm, with the elbow fused at forty-five degrees and adactylia involving two rays of the hand, associated with a congenital thoracic scoliosis. The remaining patients had less complex deformities, with one case of webbed fingers, three cases of absent fingers, one case of camptodactyly, one syndactylism of the ring and little fingers of both hands, one case of absent pectoralis major, one bilateral amelia, two cases of generalized limb

TABLE 1
Idiopathic Scoliosis

Sex	Hand Def.	Assoc. Def.	Curve Location	Onset/ Severity*	Comment
M	Webbed fingers R & L Thenar dysplasia R & L	R Clubfoot	R Thoracic	Infantile 88°	—
F	Hypoplasia L arm with antecubital webbing dislocation L radial head, fusion 4th & 5th metacarpals absence of L thumb	Failure of segmentation C2-3 congenital dislocation L hip hypoplasia L lung	R Thoracic	Infantile 41°	Multiple congenital anomalies
M	R & L Proximal radio-ulnar synostosis, fusion L trapezoid-capitate	Fusion 2 & 3 cuneiforms mental retardation fusion talus & navicular	L Thoracic R lumbar	19°	Multiple congenital anomalies
M	Absence of L Radius Hypoplasia R thenar muscles	Fusion C1-2, R cryptorchism, hernia, hydrocele, micrognathia	R Thoraco-lumbar	15°	Multiple congenital anomalies
F	Hypoplasia L upper extremity	None	R Thoracic	Juvenile 34°	Posterior spine fusion
F	Hypoplasia R upper extremity	Torticollis	R Thoracic	Juvenile 50°	HRSF†
M	Absence 1st ray L hand Hypoplasia R thumb	None	R Thoracic	Adolescent 58°	HRSF†
F	R & L camptodactyly	R & L Pes Cavus	R Thoracic	Adolescent 74°	HRSF†
F	Bilateral amelia	None	R Thoraco-lumbar	Juvenile 50°	HRSF†
M	R syndactylism & hypoplasia	Absence of R pectoralis major, Scheuermann's kyphosis, spina bifida occulta, T2 pectus excavatum	L Thoracic R Thoracic L Lumbar	28° Adolescent 37° 25°	—
M	Absence of L pectoralis major	—	R Thoraco-lumbar	Juvenile 5°	lost to follow up at 9 years
M	R & L hypoplasia of radius, scaphoid, trapezium thumb	Failure of segmentation C2-3-4, spina bifida occulta	R Thoracic	Adolescent 24°	—

*Degrees of curvature as measured by the Cobb technique
†HRSF - Harrington Instrumentation and Spine Fusion

atrophy, two cases of supernumerary thumbs, and one case of thenar aplasia.

Associated Anomalies

More than half of the patients had at least one other associated anomaly. Five patients (24%) had one abnormality in addition to their hand and spine deformities; three (14%) had two anomalies, and four (19%) had greater than two anomalies. Nine patients (43%) had no other anomalies. The most common site of abnormality was in the face, with three ear abnormalities, two micrognathia, one cleft palate, one esotropia, one uncharacterized abnormal facies and one torticollis. There were five foot deformities, with two clubfeet, two cavus feet and one tarsal coalition. There was one case of congenital dislocation of the hip. There were two gastrointestinal abnormalities; one imperforate anus and one tracheoesophageal fistula. There was one case of pectus excavatum and one of hypoplasia of the left lung. There was one case of renal ectopia, and one case with cryptorchism, hydrocele and hernia.

Case Report

At the age of two years and three months this female patient was admitted to the prosthetic service for fitting of bilateral upper extremity paddle prosthesis. An idiopathic, right thoracolumbar scoliosis was first noticed at age three years and ten months. By age four years, five months the curve had progressed to fifty degrees and she was placed in a Milwaukee brace. She was able to wear bilateral upper extremity prostheses and the brace with good correction of her curve to eighteen degrees. During adolescence, her curve progressed despite brace treatment, and at age twelve years, seven months she had a forty-nine degree curve, standing in the brace, which increased to sixty-eight degrees out of the brace. She underwent posterior spine fusion with Harrington rod instrumentation T5-L2 with correction of the curve to thirty-one degrees on the day of surgery. She was discharged ambulatory in a Risser body cast, modified to allow her to wear bilateral, electrically powered Canadian upper extremity prostheses, and attained a solid fusion with curve correction to thirty-six degrees. She was maintained in a Milwaukee brace until age fifteen years, five months when the brace was discontinued. At age twenty years, six months she was working full time at a bank

TABLE 2
Congenital Scoliosis

Sex	Hand Def.	Assoc. Def.	Curve Location	Severity	Comments
M	R complete phocomelia & partial adactylia involving 4 rays L Incomplete paraxial hemimelia L forearm, elbow fused at 45° adactylia involving 2 rays	None	T7-L2	70°	Posterior Spine Fusion
M	Absence of R radius 1st metacarpal, thumb	Abnormal ear configuration	Cervico-Thoracic	—	—
M	Absence of L Thumb	L Clubfoot	R Thoracic	40°	Post. Spine fusion with HRI
F	Hypoplastic L Thumb	L Sprengel's def. R esotropia R cavus foot Diastematomyelia L Spina bifida occulta	R Thoracic L lumbar	67° 48°	P.S.F.
M	Supernumerary R Thumb	None	Cervico-Thoracic	15°	Lost to follow up age 3.
M	R Thenar hypoplasia	Klippel-Feil Syndrome Imperforate anus	T8-T12	25°	P.S.F.
M	Duplication R Thumb	Tracheo-esophageal fistula	Cervico-Thoracic	27°	—
F	Absence of L Radius & First Ray	Hypoplasia L ear Hypoplasia L Mandible Cleft palate L renal ectopia	Cervico-Thoracic	30°	Awaiting Surgery
M	Congenital absence L radius and first ray	Klippel-Feil syndrome Spina bifida occulta C7	Cervico-Thoracic	31°	Milwaukee Brace

Lost to follow-up age 3.



Fig. 1—Age 3+10 when scoliosis first noticed.

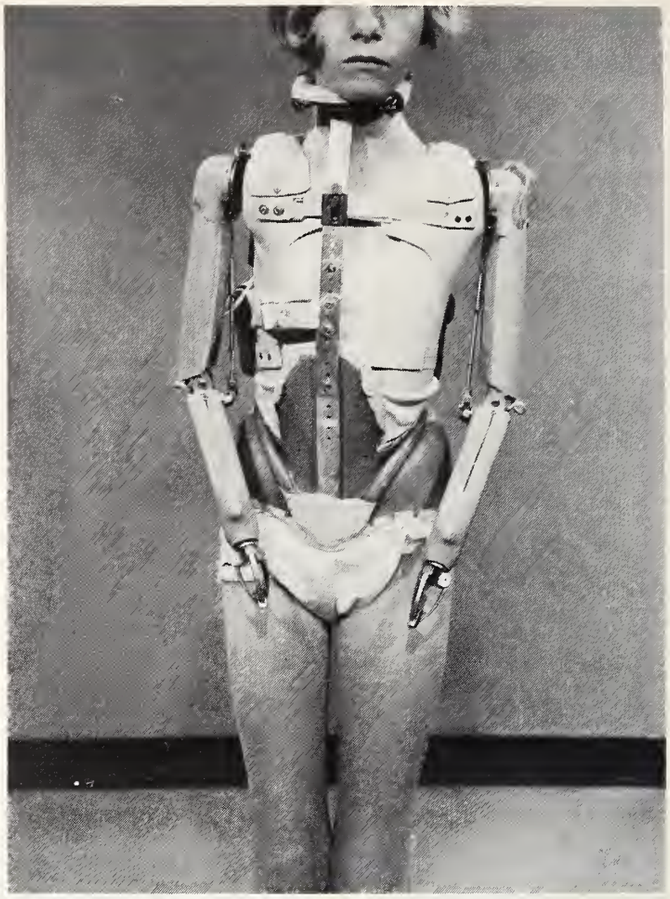


Fig. 2—Age 13+5 (10 months after fusion) Unencumbered prosthesis use while in Milwaukee Brace.

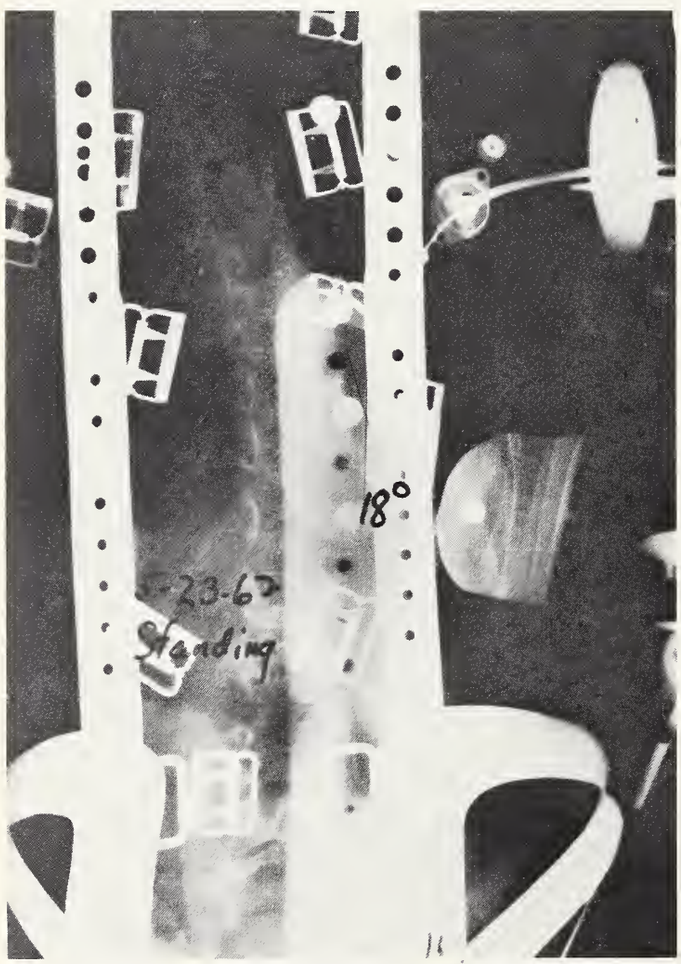


Fig. 3—Age 6+5 maximum correction in brace.



Fig. 4—Curve immediately prior to fusion.

answering telephones, and her curve measured fifty degrees. She had returned to wearing conventional mechanical upper extremity prostheses, and had no complaints referable to her spine (Figures 1-5).

This patient illustrates multiple combined congenital anomalies. She was first seen at Gillette at age eight months where the following diagnoses were made: congenital absence of the left radius, congenital cervicothoracic scoliosis with multiple hemivertebrae, hypoplasia of the mandible, hypoplasia of the left ear, cleft palate and right renal ectopia. During her first hospitalization at the age of ten months she was placed in a Milwaukee brace. Her left radial club hand was passively stretched and was placed in a splint to hold its corrected position. At age twenty months the left hand was centralized on the ulna with a good clinical result. She now uses the hand actively to assist the right, and consideration is being given to policization of the index ray. Her curves are stable in the Milwaukee brace, and she is followed by plastic surgery for reconstruction of her facial abnormalities. She is currently five and one-half years old, doing well, with anticipated additional spinal and facial reconstructive surgery in the future (Figures 6 and 7).

Discussion

The association of radial club hand with scoliosis, prominent in our series, is consistent with other series of radial club hands in the literature. At Gillette, four of the thirty patients with congenital absence of the radius, or 13%, had the association. In a recently



Fig. 6—Appearance when first seen at Gillette Hospital.



Fig. 5—Solid fusion. Brace removed at this time.

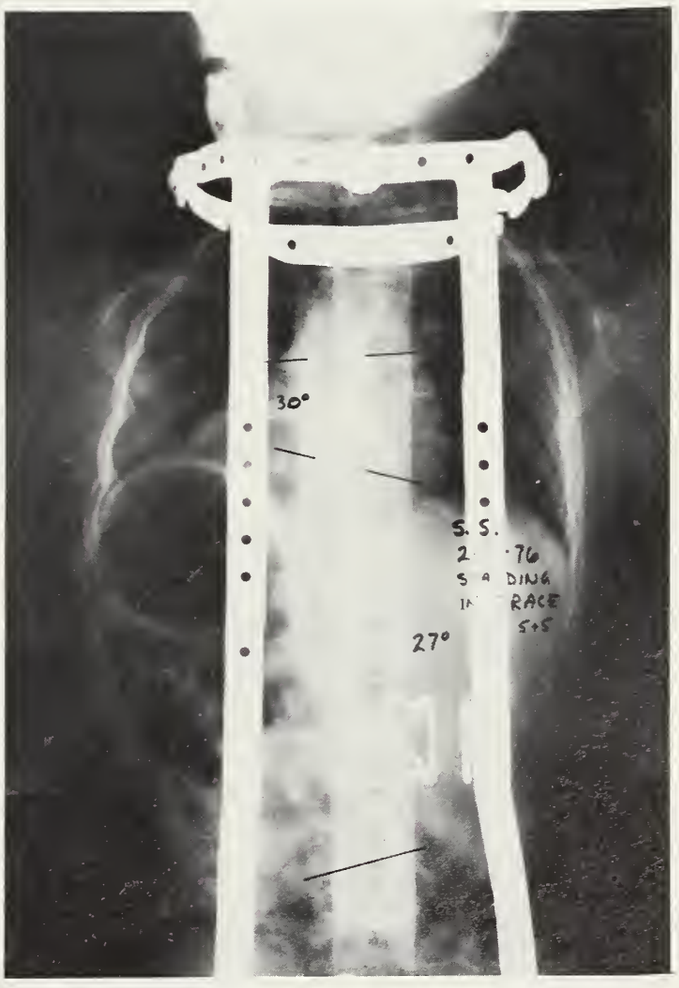


Fig. 7—Current Xray standing in brace.

published series of fifty-four children with congenital absence of the radius, Lamb[4] found that nine (16%) had associated scoliosis. In Makley's series[6] the incidence is even higher. In his series, however, the most common curve pattern was idiopathic in contrast to ours where congenital cervicothoracic curves predominated. In his series, as well as ours, there was a spectrum of either associated anomalies. 57% of the patients in the present series had at least one other organ system involved in addition to the spine and upper extremity.

The patients identified in this series were only those in whom significant clinically apparent spinal deformity existed. The spines of all patients treated here for hand deformities were not examined radiographically, and thus the incidence of milder, idiopathic curves may be higher than that recorded in our study. The orthopedic care of the spinal deformities was not significantly compromised by the presence of hand deformities. Even in our patient with bilateral amelia, spinal fusion could be performed and still permit use of bilateral upper extremity prostheses.

The routine school screening for scoliosis of 80,144 Minnesota children using rib hump or forward bending has shown a prevalence of scoliosis of 2.5% in boys and 4.3% in girls.[5] Other studies have indicated a prevalence rate of 0.133% to 3.7%.[2,9,10] Therefore, the 10.3% incidence of scoliosis requiring treatment in our patients is highly significant.

There were three cases of idiopathic curve pattern occurring with multiple congenital anomalies. We feel that these represent a distinct clinical entity. We, along with other authors, are unable to explain why an idiopathic curve appears in a patient with a congenital arm anomaly.

The association of multiple congenital anomalies was not confined to congenital curves. There were three patients with idiopathic curve patterns and at least three other anomalies. The temporal and physical proximity of the developing limb buds to other developing systems embryologically would seem to point to an association on that basis. The diversity of anomalies seen in this series however, makes any unitary embryological explanation of our findings unlikely.

Summary and Conclusions

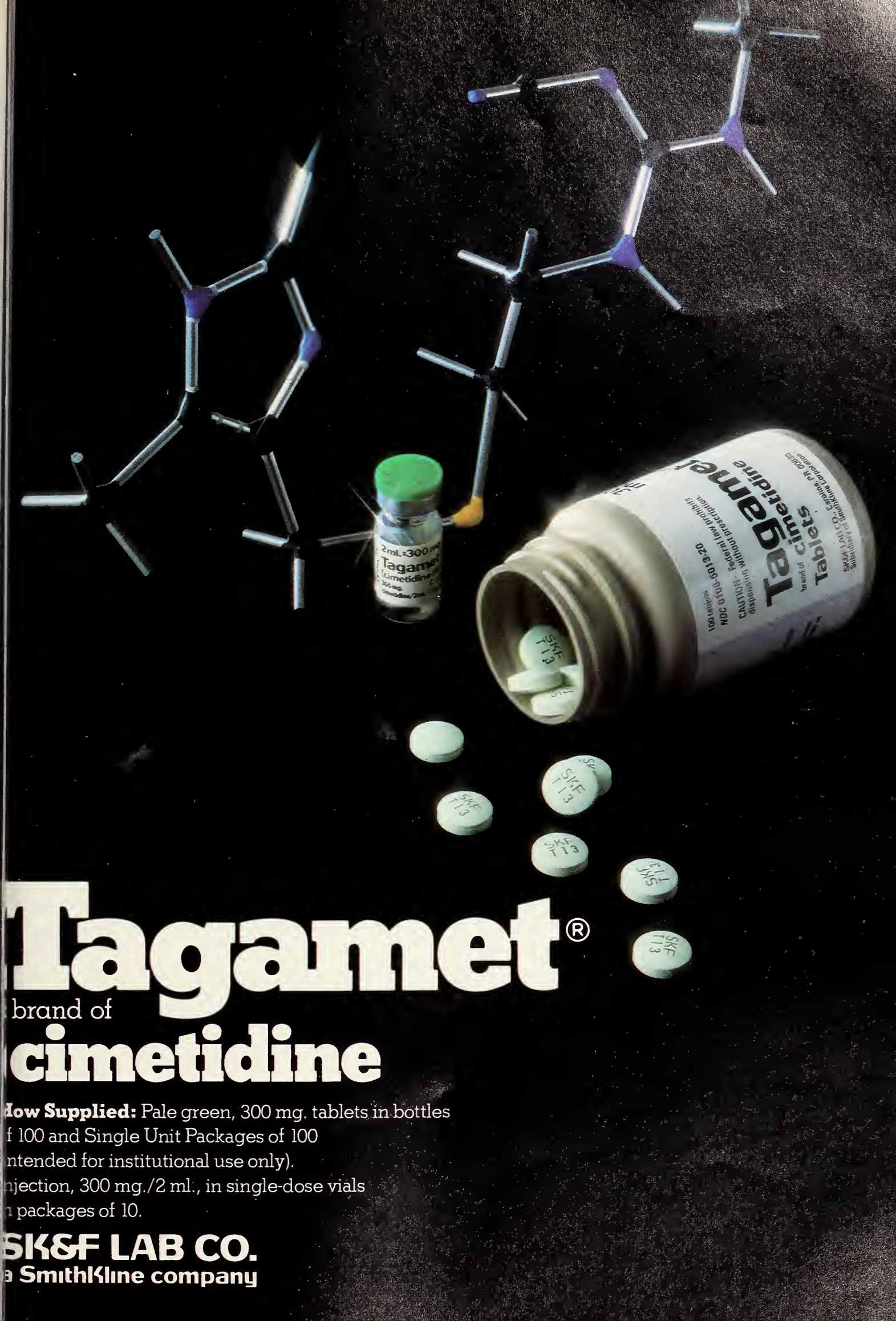
The records of 203 patients treated for congenital hand deformity at Gillette Children's Hospital were reviewed for the type of upper extremity deformity, spinal deformity, and the presence of other associated anomalies. Of the 203 patients, twenty-one (10.3%) had associated hand and spine deformities, with twelve of the twenty-one (57%) having idiopathic curve patterns and nine of the twenty-one (43%) having congenital scoliosis. At least one additional anomaly was present in twelve of the twenty-one patients, (57%) and patients with multiple congenital anomalies were identified with both idiopathic and congenital curve patterns. The most common association was between congenital absence of the radius and congenital cervicothoracic scoliosis (four cases), although a spectrum of hand deformities was present. Even in the presence of severe upper extremity deformity, satisfactory treatment of spine deformity with the Milwaukee brace, spine fusion and postoperative body cast was possible. Evaluation of all patients with congenital upper extremity deformity for spine deformity is recommended.

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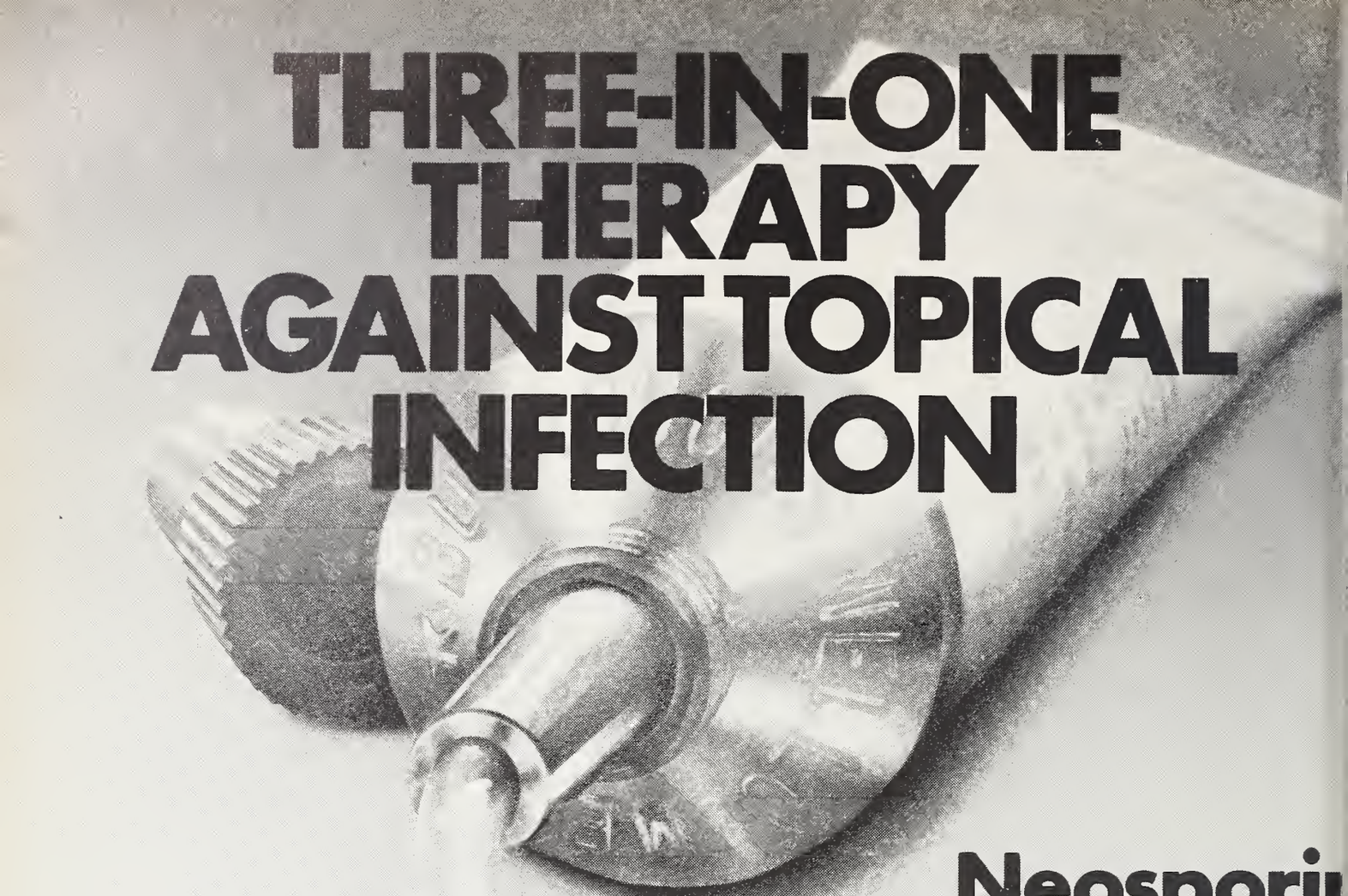
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Editorials

The Gillette Sitting Support

The "Gillette" Sitting Support Orthosis* adds a new device for the care of the severely involved cerebral palsy or advanced muscular dystrophy child. The patients are not able to support themselves, and any brace or support used previously has been either a make-shift type of apparatus, or at best did not give the body suit contour which has been noted to be so desirable in the "Gillette" sitting support.

Obviously, careful attention to detail is required in making such a support, utilizing an experienced orthotic and prosthetic lab.

The true worth of this support can really be appreciated after seeing it in place on the child. Cost is a factor, as the child can outgrow the support in a year or two, however, because of the benefits derived it is apparent that further work along this line should be continued.

The development of this support demonstrates the value of a team approach. A two or three year follow-up would be very beneficial in fully evaluating the use of this new device.

Harry B. Hall, M.D.
Edina, Minnesota

*See page 469.

Relationship of Congenital Hand Deformities to the Spine

"The Relationship of Congenital Hand Deformities to the Spine" is a significant report for orthopaedists, pediatricians and general practitioners. The authors, Drs. Sigmond, Thompson and Winter* must be commended for a retrospective study. The Minnesota medical community is fortunate to have an institution and men who are willing to continue the specific study of children's orthopaedics.

A short perusal of the world literature does support the thrust of the article. According to the article, this is a period when general practitioners, pediatricians and orthopaedists find congenital upper extremity problems and a thorough study of the entire spine should be made.

Another salient point of the article is when a member of an associated congenital problem is found with the congenital hand and spine problem, this leads to the multi-disciplined approach in the care of this type of problem and is usually the best approach through a child orthopaedic center. As is the case with many of the studies of this nature, the obvious return to the study of basic embryology is a must and is brought out in this article.

Again, the article brings out the obvious necessities of the need for the orthopaedist, the general practitioner and the pediatrician to be beware of the spine when dealing with congenital hand problems.

Rodney H. Peterson, M.D.
Minneapolis, Minnesota

*See page 491.

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Letter to the Editor

Dear Editors:

I have written the following philosophical essay. Perhaps your readers of MINNESOTA MEDICINE would enjoy reading it:

In the Image of God

A pathologist climbs "the other mountain to see what he can see".

The Plasm and the Water

The ameba and a cell, let us say, a cell within the depths of the human (or rabbit, or raccoon) liver, are not as different from one another as one might suppose. Both cells negotiate across the same sort of membrane with very much the same sort of immediately surrounding thin film of water. The only important difference between them is one of station. The ameba is unattached and mobile and is free to exchange, as it were, one thin film of water for another. The liver cell, instead, lies immobile within a community of cells and must depend, for the habitability of its thin film of water, upon an interiorized, piped-in, water-system-in-motion.

Within this frame of reference, the total cell-population of the earth can be envisioned as being in a sol-gel relationship with earth's water. On the one hand there are free-living cells and water, with water predominating, and therefore in "sol" state; on the other there are the cells of multicellular organisms, with cell mass predominating, and therefore in "gel" state. The one cell is single and autonomous; the other is one of many that have been "organized"; but the two are bound by the same state of cellness — cousins, however much removed.

The Plasm

The origins speak eloquently for the basic autonomousness of all cells, single and singly. Each creative event, no matter how complex is to be its outcome, is initiated unicellularly. The zygote results from the union of two genetically half cells, the gametes. "Ontogeny recapitulates phylogeny". Contemporary single-celled organisms have "arrived" from the start. They are born unicellular and remain unicellular. They have no ontogeny to speak of. They multiply by means of BINARY FISSION, simply by splitting into two like daughter-cells, asexually. The multicelled species, instead, depend, for their reproduction, upon the sexuality of their mature adults. Following their conception, these larger creatures are obliged to undergo successive gestational changes in body form that telescope into time the evolutionary changes of body form of millions of years of ancestors. The off-spring of these "higher" forms of life increase their cells by means of MITOSIS, a process that replicates more faithfully the individuality of the species than does BINARY FISSION. The Plasm of single-celled organisms is immortal. When these creatures reach the end of the line they turn into two revitalized daughter-cells. The larger multicelled organisms, instead, convey their Plasm into biologic cul de sacs — death — rescuing only that portion of their Plasm that is carried by the gametes, their own, and those of their progeny. The insects and the parasitic worms reach sexual adulthood by means of a process that requires that they undergo staggered stages of development during which, for given periods of time, they become arrested first at one body form, and then at successive others — a terraced sort of ontogeny.

The Water

Nature conducts its symphony of creation according to the dictates of one simple rule — THE CELL, IRRESPECTIVE OF ITS BIOLOGIC VICISSITUDES, MUST NEVER LOSE CONTACT WITH WATER. Save for exceptional cells — the spores of certain

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bacteria — the cyst-forms of intestinal protozoa, the ova of intestinal parasites, the pollens, and the seeds, all cells, the cells of animals and plants alike, the cells of all creatures large and small, require continued immersion in water. Both ontogeny and phylogeny can be depicted meaningfully only if first translated into the language of this obligatory intimacy between cell and water. "Plasm" takes on reality as a "cell" only when contained within a membrane that separates it from the water around it.

Every Biology text that I have seen has had, in its very first few pages, a picture of a cell sitting high and dry without water around it. This is a myth. The cell, if it is to be portrayed realistically, must have water around it. All the arguing about Heredity versus Environment becomes unnecessary when it is realized that the two elements are both operative from the start.

The Kinship of all Cells

The kinship of all cells of the earth is a biologic necessity. The eat-and-be-eaten scheme of things by which the species participate in the food chains would not be possible without the compatibility of one flesh for another. Also, the provision by which dead organisms are slowly picked apart, first by carrion eaters, then by insects, and finally by microorganisms, guarantees that the earth's surface does not become littered with the hulks of lifeless creatures. Such a disposal system could not operate without the attraction of the remains of one species to other species.

Nature's Scenario and Plot

The thrust of Nature is REPRODUCTION. The species survive by the reproduction of the fittest among their individuals; the individuals "survive" only if they have reproduced. Nature tumbles through its reproductive cybernetics resorting to endless plasticity of tissue as it fashions its claws, feathers, fangs, and hair, and its wild array of fin, web, tentacle, snoot, and appendage. Function is devised according to the exigencies of Environment; Structure is devised according to the exigencies of Function. Parading before us is a continuum of reproduction that is heading Heavens only knows where.

Nature's Template

Having once found a reproductive means that suits its purposes, Nature repeats its trick over and over. This repetitiveness provides us with valuable clues. An example of this: The present day position of plants as the first link in the food chains suggests that the first cell to make its appearance must have been a plant cell because, as is the case with today's plant-cells, the first cell must have been able to convert mineral matter into organic matter through photosynthesis, since no preexistent organic matter was present in its environment for it to feed upon. Its place of birth, one can surmise, must have been a shoreline confluency of water, mineral earth, and atmospheric gases, shallow enough to have permitted penetration of sunlight.

This retrospective manner of reckoning enables us also to conceive of the human being in basic terms of a composite "cell" bathed in a thin film of sea water-like water. The vast tangled tracts of anatomic tubes and pipes carrying juices, pastes, and air, are then perceived as catering systems of this intercellular sea water, that keep it clean and refreshed, and replenished with oxygen and nutrients. That superb filtering system, the kidneys, ureters, bladder, and urethra, exists only to keep pure the sea water-like quality of the bathing water. Whales, turtles, eels, butterflies, and sparrows are composite "cells" like me, differing from me only in unimportant peripheral ways. The environment from which all cells derive their 'goodies' is one and the same; the environment into which all cells dump their wastes is one and the same.

By incorporating medical thinking into a broader biologic frame of reference, we enrichen it. Infectious diseases, in this context, are regarded no longer imperiously as invasions and incursions of microorganisms into the "temple" that is the human body. They become more properly reoriented into a vaster scheme of general ecology of which



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they become but a small part. The cancer cell can be viewed, profitably, as one that, for whatever reason, suddenly declares independence of the body-economy and takes off on its own tangent, alone. The cancer cell seems to "remember" its ancestral free-living state, and to return to it. The restraints that ordinarily keep community-cells in line somehow give way, and a cell reverts to the primitive autonomous state and multiplies into a cancer. We already communicate about cancer with language that betokens the cell-way of reasoning. We speak of malignant neoplasms as being more or less "differentiated"; we make reference to the "biology" of a tumor.

Deductive Reasoning

Much of this paper represents deductive thinking. It has attempted a new way of handling old information. Claude Bernard spoke about the "milieu intérieur" about one hundred years ago, as did Rudolf Virchow about his "Cellular Hypothesis". Indeed, a good deal of data that parade about as sophisticated knowledge are based unconsciously upon wisdom of the cell and of things cellular.

Deduction is based upon knowledge gained from the inductive reasoning of many man-hours of hard research. It is the plum of the Scientific Method. It must be picked before it dries on the limb. Deductive thinking provides us with much of the poetry of our existence. The history of Medicine is filled with examples of the slow, gradual recognition that what had formerly been regarded as separate entities could all be drawn into one package. One such instance is the realization that Hydrops Fetalis, Icterus Gravis, and Icterus Neonatorum, long thought to be separate diseases, represented different grades of severity of Erythroblastosis Fetalis. Other good examples are the gatherings together of many supposedly unassociated conditions under the single headings of Collagen Disease and of Autoimmune Disease. Inductive thought fattens our medical books into encyclopedic listings; deductive reasoning slims them down into inclusive syndromes, still listings to be sure, but more widely ranging in scope.

Who? What? Where? When?

At first shock the notion that man is, after all, just a cluster of cells held together within a matrix of marine water is very apt to have a disheveling effect, particularly when the human cell-cluster is made out to bear a kindred relationship to the cell-clusters that are earthworms, centipedes, or beetles, or even elephants or kangaroos. But once the concept is accepted and is lived with for a while, it becomes less unpretty. Soon, one becomes intoxicated with the sweep and clout of the whole scheme. Finally, it becomes essential to logic and rationality. This affair of the cell, one then sees, is woven through the entire fabric of the stuff of living things. It provides unity and continuity to what is otherwise chaotic.

The notion that we are "made in the image of God" becomes transparently faulty. The "Image" is there and is unmistakable, but to make it "of God" requires that it be broadened to encompass all living things.

The realization that a bond exists among all the creatures should quicken the heart and ought to make the step toward the brotherhood of man that much the shorter. No violence need be suffered by one's sensibilities. Instead, a deeper sense of security should inherit from the cover of the grand panoply of Nature.

Reduced to scale, and plotted against Time and Space, the affairs of the Plasm seem to boil down to mere interludes between zygotes, with cannibalism at the end — an awful perspective with which to live. The mind reaches its limits and we are brought to that point in another of Nature's full-circles where the supereducated touch with the uneducated. Though we receive signals of a master-plan, we cannot make out definite end-points. Perhaps the mind is on its way to evolving into an instrument better than it now is, but for the present we can only do the best that we can within its limitations.

There are no pat answers, just points of view and philosophies that are essentially personal and private. I manage my own existence by accentuating the beautiful parts of the

human condition. I pride myself in belonging to the same species of being as Socrates, Emerson, DaVinci, Chopin, and Hugo. Whenever I hear or see something ugly, I force myself to concentrate on beautiful people such as Longfellow, Sam Levenson, the next-door neighbor who generously helped me change my flat tire, and the lady who was reported to have run into a burning nursery school and to have rescued twelve children before she ran in again to her death. I work hard at resisting the animality that I inherited with my psyche. I pray much.

Camillo V. Bologna, M.D.
Moorhead, Minnesota

Continuing Medical Education
University of Minnesota

Pediatric Radiology — September 11-15, 1978
West Bank Auditorium, University of Minnesota, Minneapolis, Fee: $275

Presentations of computed tomography, ultrasound and nuclear radiology in the diagnostic work-up of diseases in children.

Female Incontinence — Neuromuscular Dysfunction of the Lower Urinary Tract, September 14-15, 1978 — Mayo Memorial Auditorium, University of Minnesota, Fee: $250

Current concepts in female stress incontinence and neuromuscular dysfunction of the lower urinary tract will be presented, wtih emphasis placed on neurourodynamics, pharmacotherapy and surgical treatment.

Directions in Adolescent Psychiatry — September 15-17, 1978
Health Sciences Unit A, Room 2-620, University of Minnesota, Minneapolis, Fee: $75 ($70 for members of American Society of Adolescent Psychiatry) $50 for allied health personnel

This conference will consider mal-direction that interferes with a smooth passage from adolescence to adulthood as well as successful direction negotiated by the adolescent.

Topics in Geriatrics Medicine — September 20-21, 1978
Mayo Memorial Auditorium, University of Minnesota, Minneapolis

Genitourinary dysfunction, cerebral dysfunction, diabetes in the elderly, circulation and blood disorders, aging gut and cardiology diagnoses and management of procedures.

Treatment of Family Sexual Abuse — September 20-22, 1978
Program in Human Sexuality, University of Minnesota, Minneapolis — Fee: $100

The objectives will enable participants to gain a better understanding of family sexual abuse, increase their knowledge of treatment methods, develop counseling skills, and obtain additional resource information on therapy methods.

Internal Medicine Review — September 27-29, 1978
Mayo Memorial Auditorium, University of Minnesota, Minneapolis

The topics to be included this year are cardiology, hematology and gastroenterology.

Sexual Attitude Reassessment Seminar — September 29-30, 1978
Program in Human Sexuality, University of Minnesota, Minneapolis

Designed to help physicians examine their own attitudes and values as a basis for dealing effectively with patient problems in this medically important area.

For further information or brochures on these programs, please call or write the Office of Continuing Medical Education, Box 293 Mayo Memorial Building, 420 Delaware Street SE, Minneapolis, MN 55455 (612-373-8012).

Continuing Medical Education

Q and A — CME

Questions from Minnesota Physicians Concerning Continuing Medical Education may be Addressed to:

MMA Committee on Medical Education
Suite 900
101 East 5th Street
St. Paul, MN 55101

Those answered in MINNESOTA MEDICINE are the most common or the most appropriate to a specific time. Queries from individuals will be answered as rapidly as possible only if a self-addressed stamped envelope is enclosed.

Q. If the State Board uses lower standards than some professional organizations for acceptable CME, won't that tend to downgrade all educational efforts? After all licensure is not voluntary!

A. Clearly we need common standards of educational quality and CME requirements. This should gradually come about. Meanwhile, the questioner should review the CME material sent recently to licensees by the Board of Medical Examiners. Board requirements are very similar to the largest CME reporting effort in the United States – the AMA-PRA. Although the PRA requirements for Category I credit are detailed by that organization, the Board's required information for Category I approval is very similar. This includes application in advance, a detailed description of the course, names and credentials of presenters, description of presentation site and others. QA-CME believes that today's similar intent of all groups for excellent CME will bring about similar standards tomorrow.

Q. I plan to retire from practice this year, yet I don't want to give up the license I worked hard for and have held for nearly 50 years. What are the possibilities that the Board will let me keep my license?

A. QA-CME can only suggest an answer as the final decision rests within the authority of the Board of Medical Examiners. The Rules provide no exemption from CME reporting for non-practicing physicians. However, Subdivision J of the Rules does provide latitude for a possible special procedure. Here the Board has the right to "condition, limit or qualify the license of any person whom the Board determines has failed to comply with the requirements of this rule."

Inasmuch as the licensee and licensing body are persons of good will and prudence, dedicated to the health of Minnesota's citizens, it would seem probable that a specially designated conditioned license might be assigned, reflecting the retired physician's credentials as well as his "no practice" status. In rare situations, as the only available provider of emergency care, this physician could save life or limb. The licensed but retired status would seem to be of legal, ethical and moral significance.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

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ole, D.R., et al.: Antimicrob. Ag. Chemother. 11(6):1033-1035 (June) 1977.

ue penetration is essential to therapeutic efficacy; however, cific tissue levels have not been directly correlated with specific apeutic results.

ore prescribing, see complete prescribing information K&F literature or PDR. The following is a brief summary.

cations: Ancef® (sterile cefazolin sodium, SK&F) is indicated in reatment of the following serious infections due to susceptible nisms:

iratory tract infections due to Streptococcus pneumoniae erly D. pneumoniae), Klebsiella species, Hemophilus influenzae, hylococcus aureus (penicillin-sensitive and penicillin-resistant), group A beta-hemolytic streptococci.

table benzathine penicillin is considered to be the drug of choice eatment and prevention of streptococcal infections, including rophylaxis of rheumatic fever. 'Ancef' is effective in the eradica- of streptococci from the nasopharynx; however, data establishing efficacy of 'Ancef' in the subsequent prevention of rheumatic are not available at present.

ary tract infections due to Escherichia coli, Proteus mirabilis, siella species, and some strains of enterobacter and enterococci.

structure infections due to Staphylococcus aureus (penicillin- tive and penicillin-resistant), group A beta-hemolytic streptococci other strains of streptococci.

y tract infections due to Escherichia coli, various strains of tococci, Proteus mirabilis, Klebsiella species and Staphylococcus us.

and joint infections due to Staphylococcus aureus.

ital infections (i.e., prostatitis, epididymitis) due to Escherichia coli, us mirabilis, Klebsiella species, and some strains of enterococci.

icemia due to Streptococcus pneumoniae (formerly D. umoniae), Staphylococcus aureus (penicillin-sensitive and cillin-resistant), Proteus mirabilis, Escherichia coli, and Klebsiella ies.

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opriate culture and susceptibility studies should be performed etermine susceptibility of the causative organism to 'Ancef'.

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There is some clinical and laboratory evidence of partial cross-allergenicity of the penicillins and the cephalosporins. Patients have been reported to have had severe reactions (including anaphylaxis) to both drugs.

Any patient who has demonstrated some form of allergy, particularly to drugs, should receive antibiotics cautiously. No exception should be made with regard to 'Ancef'.

Usage in Pregnancy: Safety of this product for use during pregnancy has not been established.

Usage in Infants: Safety for use in prematures and infants under 1 month of age has not been established.

Precautions: Prolonged use of 'Ancef' may result in the overgrowth of nonsusceptible organisms. Careful clinical observation of the patient is essential.

When 'Ancef' is administered to patients with low urinary output because of impaired renal function, lower daily dosage is required (see dosage instructions). A false positive reaction for glucose in the urine of patients on 'Ancef' has occurred with Clinitest® tablets solution.

Adverse Reactions: The following reactions have been reported: **Hypersensitivity:** Drug fever, skin rash, vulvar pruritus, and eosinophilia have occurred. **Blood:** Neutropenia, leukopenia, thrombocythemia and positive direct and indirect Coombs tests have occurred. **Hepatic and Renal:** Transient rise in SGOT, SGPT, BUN and alkaline phosphatase levels has been observed without clinical evidence of renal or hepatic impairment. **Gastrointestinal:** Nausea, anorexia, vomiting, diarrhea, oral candidiasis (oral thrush) have been reported. **Other:** Pain at site of injection after intramuscular administration has occurred, some with induration. Phlebitis at site of injection has been noted. Other reactions have included genital and anal pruritus, genital moniliasis, and vaginitis.

How Supplied: Ancef® (sterile cefazolin sodium, SK&F)—supplied in vials equivalent to 250 mg., 500 mg., or 1 gram of cefazolin; in "Piggyback" Vials for intravenous admixture equivalent to 500 mg. or 1 gram of cefazolin; and in Pharmacy Bulk Vials equivalent to 5 grams or 10 grams of cefazolin.

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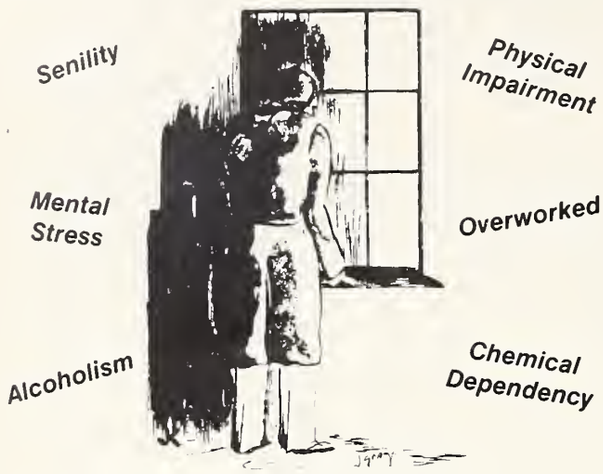
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Brief Summary of Prescribing Information
Combined TEGOPEN® (cloxacillin sodium)
Capsules and Oral Solution
For complete information, consult Official Package Circular. (12) TEGOPEN 9/11/75

Indications: Although the principal indication for cloxacillin sodium is in the treatment of infections due to penicillinase-producing staphylococci, it may be used to initiate therapy in such patients in whom a staphylococcal infection is suspected. (See Important Note below.)

Bacteriologic studies to determine the causative organisms and their sensitivity to cloxacillin sodium should be performed.

Important Note: When it is judged necessary that treatment be initiated before definitive culture and sensitivity results are known, the choice of cloxacillin sodium should take into consideration the fact that it has been shown to be effective only in the treatment of infections caused by pneumococci, Group A beta-hemolytic streptococci, and penicillin G-resistant and penicillin G-sensitive staphylococci. If the bacteriology report later indicates the infection is due to an organism other than a penicillin G-resistant staphylococcus sensitive to cloxacillin sodium, the physician is advised to continue therapy with a drug other than cloxacillin sodium or any other penicillinase-resistant semi-synthetic penicillin.

Recent studies have reported that the percentage of staphylococcal isolates resistant to penicillin G outside the hospital is increasing, approximating the high percentage of resistant staphylococcal isolates found in the hospital. For this reason, it is recommended that a penicillinase-resistant penicillin be used as initial therapy for any suspected staphylococcal infection until culture and sensitivity results are known.

Cloxacillin sodium is a compound that acts through a mechanism similar to that of methicillin against penicillin G-resistant staphylococci. Strains of staphylococci resistant to methicillin have existed in nature and it is known that the number of these strains reported has been increasing. Such strains of staphylococci have been capable of producing serious disease, in some instances resulting in fatality. Because of this, there is concern that widespread use of the penicillinase-resistant penicillins may result in the appearance of an increasing number of staphylococcal strains which are resistant to these penicillins.

Methicillin-resistant strains are almost always resistant to all other penicillinase-resistant penicillins (cross-resistance with cephalosporin derivatives also occurs frequently). Resistance to any penicillinase-resistant penicillin should be interpreted as evidence of clinical resistance to all, in spite of the fact that minor variations in *in vitro* sensitivity may be encountered when more than one penicillinase-resistant penicillin is tested against the same strain of staphylococcus.

Contraindications: A history of a previous hypersensitivity reaction to any of the penicillins is a contraindication.

Warning: Serious and occasionally fatal hypersensitivity (anaphylactoid) reactions have been reported in patients on penicillin therapy. Although anaphylaxis is more frequent following parenteral therapy it has occurred in patients on oral penicillins. These reactions are more apt to occur in individuals with a history of sensitivity to multiple allergens.

There have been well documented reports of individuals with a history of penicillin hypersensitivity reactions who have experienced severe hypersensitivity reactions when treated with a cephalosporin. Before therapy with a penicillin, careful inquiry should be made concerning previous hypersensitivity reactions to penicillins, cephalosporins, and other allergens. If an allergic reaction occurs, the drug should be discontinued and the patient treated with the usual agents, e.g., pressor amines, antihistamines, and corticosteroids.

Safety for use in pregnancy has not been established.

Precautions: The possibility of the occurrence of superinfections with mycotic organisms or other pathogens should be kept in mind when using this compound, as with other antibiotics. If superinfection occurs during therapy, appropriate measures should be taken.

As with any potent drug, periodic assessment of organ system function, including renal, hepatic, and hematopoietic, should be made during long-term therapy.

Adverse Reactions: Gastrointestinal disturbances, such as nausea, epigastric discomfort, flatulence, and loose stools, have been noted by some patients. Mildly elevated SGOT levels (less than 100 units) have been reported in a few patients for whom pretherapeutic determinations were not made. Skin rashes and allergic symptoms, including wheezing and sneezing, have occasionally been encountered. Eosinophilia, with or without overt allergic manifestations, has been noted in some patients during therapy.

Usual Dosage: Adults: 250 mg. q.6h.

Children: 50 mg./Kg./day in equally divided doses q.6h. Children weighing more than 20 Kg. should be given the adult dose. Administer on empty stomach for maximum absorption.

N.B.: INFECTIONS CAUSED BY GROUP A BETA-HEMOLYTIC STREPTOCOCCI SHOULD BE TREATED FOR AT LEAST 10 DAYS TO HELP PREVENT THE OCCURRENCE OF ACUTE RHEUMATIC FEVER OR ACUTE GLOMERULONEPHRITIS.

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Please see brief summary for prescribing information.

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Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 101 East 5th, Suite 900, St. Paul, Minn. 55101.

FAMILY PRACTICE group in south metro suburban area wishes to expand to four family physicians. Interested physicians must be board certified or board eligible in family practice. Send inquiries or call Drs. Murray Hunter or Joseph Emond, River's Edge Medical Clinic, 310 Division Street, Farmington, Minnesota, 55024. 612-463-7181, Descriptive brochure available upon request.

GENERAL INTERNIST to associate with large Department of Internal Medicine in growing multispecialty group with seven clinics in the metropolitan area. Competitive compensation and liberal fringe benefits offered. Curriculum vitae invited: John W. Harkness, M.D., 2500 Como Avenue, St. Paul, Minnesota 55108.

OB-GYN, ANESTHESIOLOGIST and Orthopedic Surgeon to join progressive incorporated seven man group in Central Minnesota. 120 bed hospital. Lake area. Excellent leisure activities. Starting salary $40,000 per year. Contact Personnel Director, Little Falls Clinic, Little Falls, Minnesota. Telephone 612/632-3611.

THE FARIBAULT CLINIC, Ltd., has an opening for a Family Physician. The Clinic is in a rural community near the Metropolitan area and has seven Family Physicians, two Surgeons and two Internists. The Clinic has just completed a remodeling and expansion program. For more information please write to: Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021.

CARDIOLOGY, OPHTHALMOLOGY and ENT specialty positions available with Mankato Clinic, Ltd. This multi-specialty group attracts specialty referrals from a Southern Minnesota area of 250,000 population. Excellent group practice opportunity in All American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year, incentive pay thereafter. For more information call collect Dr. C. H. Brady or Dr. B. C. McGregor, 507-625-1811.

PHYSICIANS AVAILABLE — Pediatrics (Minn.), Cardiology (T/C or Minn.), General Surgery (Minn.), Psychiatry (T/C), Internal Medicine — Oncology (T/C), OB-Gyn (T/C), Pathology (Minn.), Family Practice (T/C), Urology (Minn.) Family Practice (Minn.-Wisc.) Radiology (Minn.). This is a sampling of physicians seeking opportunities through the services of Metropolitan Medical Placement. If you are interested in adding an additional staff member, please contact Mr. Holmes at (612) 831-5232.

FAMILY PHYSICIAN needed to join a three man family practice. This is an interesting practice, with much of clientele from Northeast and Southeast Minneapolis. Good working relationships and adequate time off. Close to the University of Minnesota, downtown, and several hospitals. Contact St. Anthony Falls Clinic, Drs. Hall, Friend, or Mindrum, at 23 N. E. 4th St., Minneapolis, MN 55413. Telephone: (612) 379-2116.

GENERAL PRACTITIONER to join MD in new Clinic in community of 2200; 25 miles southwest of Minneapolis; excellent schools and churches; productive farming area; 10-minute drive to hospital. Write or call Paul A. Stahler, M.D., Amo Vitae Clinic, 310 Sunset Drive, Jordan, MN 55352, 612-492-6323.

PHYSICIANS — Metropolitan Medical Placement offers assistance through our no obligation to the physician placement service. We always have several active listings throughout Minnesota and we specialize in *aggressively* seeking our opportunities to match each physician's individual needs. If you desire confidentiality and professionalism in our search efforts, then we ask you to please contact Mr. Holmes at 612-831-5232.

APPLICATIONS WELCOMED from board-qualified or certified radiologists, large teaching hospital, upper Midwest; university affiliation, subspecialty training in pediatrics and/or therapy desirable. Box 529, MINNESOTA MEDICINE, 101 E. 5th St., St. Paul 55101.

FAMILY PRACTITIONERS needed immediately to join present three physician corporate group practice in rural Southwestern Minnesota; guaranteed income with liberal fringe benefits; full partnership after one year; no investment necessary; new clinic facility attached to newly renovated hospital; area offers excellent recreational activities; top school systems; warm community atmosphere. Contact J.L. Bader, MD Chief of Staff, Slayton Clinic, 2744 Broadway Avenue, Slayton, Minnesota 56172; Phone number: (507) 836-6153 or 836-6463.

GENERAL INTERNIST to associate with large Department of Internal Medicine in growing multispecialty group with seven clinics in the metropolitan area. Competitive compensation and liberal fringe benefits offered. Curriculum vitae invited: John W. Harkness, M.D., 2500 Como Avenue, St. Paul, Minnesota 55108.

FAMILY PRACTITIONER is needed in Tyler, Minnesota. Ambitious community of 1,200 with a service population of 6,000 currently supports two physicians and is seeking a third. Well-equipped and staffed 32-bed hospital, with attached clinic and 43-bed nursing home. Tremendous growth potential. Enjoy the benefits of small town living. Contact Jonathan Pezalla, Administrator. 1-507-247-5521, collect, or A.L. Vadheim Memorial Hospital, 240 Willow, Tyler, MN 56178.

THIS IS A UNIQUE, and challenging opportunity for a Family Practitioner to develop and expand a central department of Family Practice with peripheral satellites for a multispecialty group in North Iowa. Strong support from the other specialties including Internal Medicine, Surgery, Ob/Gyn, Allergy, and Dermatology is available. Attractive community of 32,000 serving needs of 200,000 area citizens. Convenient to Minneapolis, Mayo Clinic, and Des Moines via I-35. Eight miles to Clear Lake "Iowa's Vacation Capitol". New office building-hospital complex (August, 1978). Second hospital in community newly remodeled and expanded. Teaching opportunities. Partnership after one year. Salary generous. Vacation and Study Time. Pension Plan program. For more information, please mail your curriculum or call collect AC 515-423-4120, and ask for the "Info Pack" from Park Clinic, 116 No. Washington Ave., Mason City, Iowa 50401.

WANTED: General surgeon to join five family practitioner group in prosperous West Central Minnesota community. Strong surgical practice, excellent benefits, salary open. Present surgeon leaving to take teaching position. Please contact Steven Virnig, Administrator, Morris Medical Center, Morris, Minnesota 56267.

FOR SALE: Burdick CS 515 Monitor, with stand, excellent condition. Perfect for Doctor's office, exercise testing, or Hospital OR use. Contact: R. L. Thienes, M.D.; Box 1161, St. Cloud, Minnesota, 56301.

INTERNIST WITH an interest in cardiology — Twin Cities internists group seek associate who wishes to weight his practice with non-invasive cardiology. Electrocardiography, active coronary care responsibilities, and resident teaching responsibilities in contacts of group practice. Curriculum vitae and references mailed to MINNESOTA MEDICINE-537, 101 E. 5th St. #900, St. Paul, Minnesota 55101

FIFTEEN MAN MULTI/SPECIALTY group needs two family practice and two OB/GYN and one man in the following departments; ENT and orthopedic surgery. Located in Northwest Minnesota's beautiful unspoiled lake and woods country. Contact J. R. Parkin, M.D., Bemidji Clinic, Ltd., Bemidji, MN 55601.

PSYCHIATRIC RESIDENCY: Vacancies for (PG2 through PG4 only) positions starting September 1, 1978 and January 1, 1979 for those who have a regular Iowa license or can obtain one by reciprocity or via FLEX. Prepare for career in private practice, community clinics or hospital based psychiatry. Emphasis on close supervision of intensive individual and group psychotherapy, OPD, Children's Unit, Adolescent Unit. Neurology affiliation with University of Iowa. The stipends are: 1st year, $22,360; 2nd year $23,478; 3rd year, $24,674. Intensity and diversity of training program appreciated best by personal visit. T.B. McManus, M.D., Superintendent, Mental Health Institute, Cherokee, Iowa 51012. Equal Opportunity Employer. Call collect 712-225-2594.

(Continued to page 514)

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(Continued from page 513)

SOUTH DAKOTA Sioux Falls Family Practice Residency is seeking a full time assistant director. Position open immediately. Program size presently 28 residents enlarging to 36. A strong affiliation exists with the Univ. of So. Dakota School of Medicine and appointments to the faculty are available. Board certification required and experience in Family Practice desirable. Salary negotiable. Send resume to L. J. Sweeney, M.D. or Howard Hoody, M.D., 1800 So. Summit Ave., Sioux Falls, SD 57105. (605) 339-1783. Equal opportunity/affirmative action employer.

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THE MIDELFORT CLINIC is seeking associates in the following areas: Allergy, Neurology, Neurosurgery, Orthopedics.
This is an opportunity to join a 47-man Wisconsin group located in college community of 50,000 with excellent hospital facilities. For further information, contact G. E. Owen, M.D., Midelfort Clinic, Ltd., Eau Claire, WI 54701

PRIMARY CARE INTERNIST/Family Practice Physician $34,700-$48,900. Complete Benefit Package. Board eligible/qualified physician to work in multi-disciplinary comprehensive community health care clinic in North Minneapolis. Opportunity to develop ambulatory care practice with possible involvement in quality assurance activity. On site radiology, laboratory and pharmacy services plus direct referrals to Hennepin County Medical Center (3 miles away). Prof. staff includes 4 board certified M.D.'s, 5 nurse practitioners and 5 dentists with 56,000 patient/client visits annually. JCAH accreditation for ambulatory care is in process. Contact: Dr. Johanna Miller, Medical Director, Pilot City Health Center, 1349 Penn Avenue North, Minneapolis, Minnesota 55411. (612) 348-4600. Affirmative Action Employer.

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Indications: Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the indications as follows:

"Possibly" effective: as adjunctive therapy in the treatment of peptic ulcer and in the treatment of the irritable bowel syndrome (irritable colon, spastic colon, mucous colitis) and acute enterocolitis.

Final classification of the less-than-effective indications requires further investigation.

Contraindications: Glaucoma; prostatic hypertrophy, benign bladder neck obstruction; hypersensitivity to chlordiazepoxide HCl and/or clidinium Br.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants, and against hazardous occupations requiring complete mental alertness (*e.g.*, operating machinery, driving). Physical and psychological dependence rarely reported on recommended doses, but use caution in administering Librium® (chlordiazepoxide HCl) to known addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions) reported following discontinuation of the drug.

Usage in Pregnancy: **Use of minor tranquilizers during first trimester should almost always be avoided because of increased risk of congenital malformations as suggested in several studies. Consider possibility of pregnancy when instituting therapy. Advise patients to discuss therapy if they intend to or do become pregnant.**

As with all anticholinergics, inhibition of lactation may occur.

Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude ataxia, oversedation, confusion (no more than 2 capsules/day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider pharmacology of agents, particularly potentiating drugs such as MAO inhibitors, phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions reported in psychiatric patients. Employ usual precautions in treating anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures. necessary. Variable effects on blood coagulation reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship not established.

Adverse Reactions: No side effects or manifestations not seen with either compound alone reported with Librax. When chlordiazepoxide HCl is used alone, drowsiness, ataxia, confusion may occur, especially in elderly and debilitated; avoidable in most cases by proper dosage adjustment, but also occasionally observed at lower dosage ranges. Syncope reported in a few instances. Also encountered: isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent, generally controlled with dosage reduction; changes in EEG patterns may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice, hepatic dysfunction reported occasionally with chlordiazepoxide HCl, making periodic blood counts and liver function tests advisable during protracted therapy. Adverse effects reported with Librax typical of anticholinergic agents, *i.e.*, dryness of mouth, blurring of vision, urinary hesitancy, constipation. Constipation has occurred most often when Librax therapy is combined with other spasmolytics and/or low residue diets.

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Readers and Reviewers: The right is reserved to reject material submitted for reading or advertising columns. The views expressed in this journal do not necessarily represent those of the Minnesota Medical Association nor any of its constituents.

Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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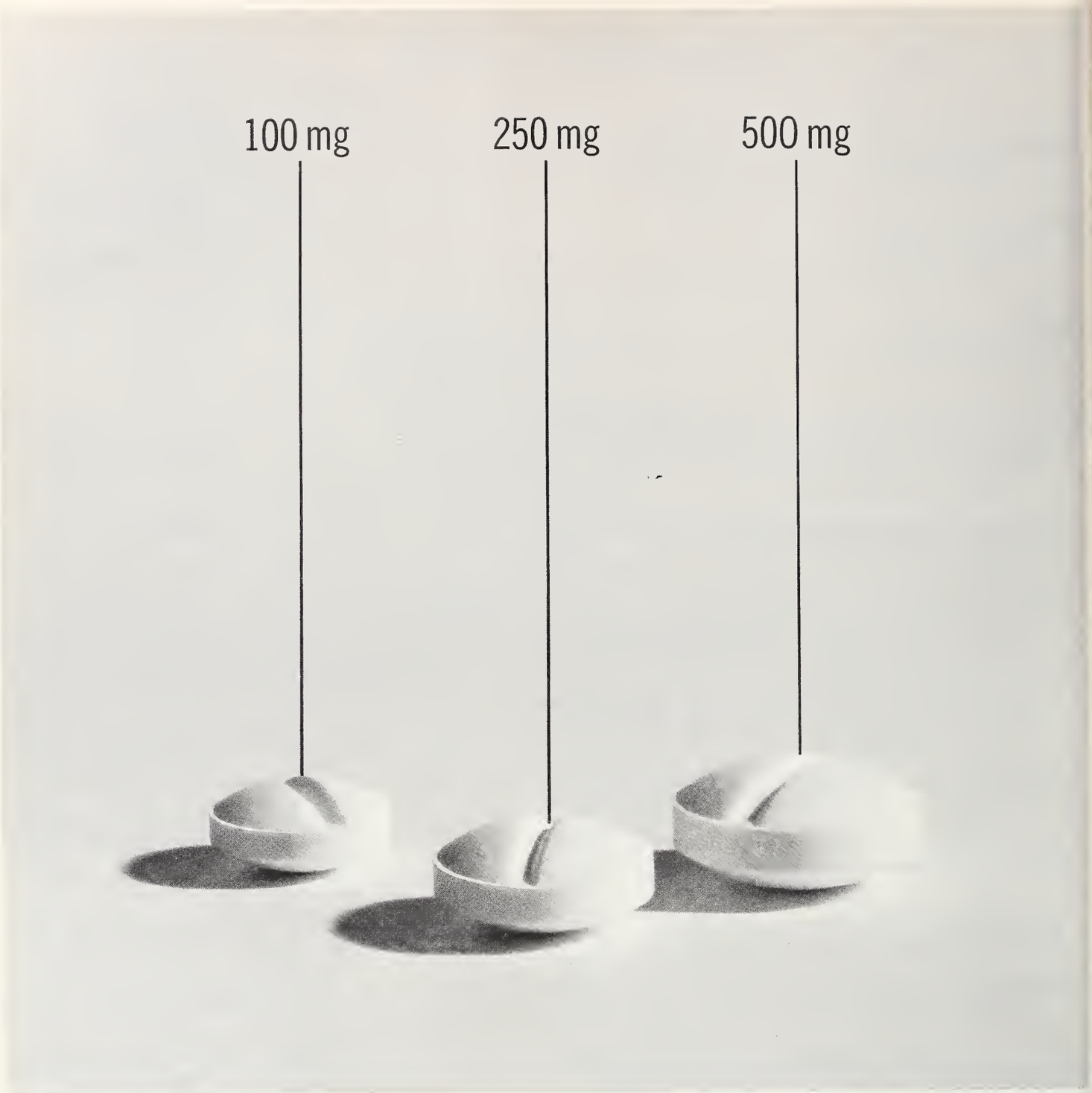
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President's Letter

What If

Sometimes while driving home from the endless number of meetings, inherent in this job, wrestling with either the internal problems of the organization or with the external problems of MMA, and while rehashing the events of the meeting mentally, the mind wanders a bit, searching for sources of some of the problems. Sometimes fantasies occur, and since fantasies are often easier to live with than the real world, they tend to be self-perpetuating.

Returning from one such meeting, the thought occurred: what if some of these appeared on the President's Page; what if some one read these and what if some one of those talented members out there, caught a germ of an idea deciding to initiate something constructive out of one of them. So here goes:

What if the PSRO Law and the Public Law 93-641 were repealed and the accomplishments summarized in a neat little one volume pamphlet. What if Secretary Califano decided to give up rules, regulations, plans, and propaganda based on untried ideas and turned against them with the vigor that he has against the cigarettes, which he also gave up. What if some MMA member would come up with a negotiating strategy that would place government on notice that the medical profession could be pushed no farther on an issue and would effectively resist, short of withholding of patient services.

What if every physician in Minnesota were to adopt a needy family known to him from his practice and act as a department of private welfare for this family helping this family not only in its medical needs, but its social and economic needs. What if the government would give that physician a tax credit for each dollar he spent in caring for the legitimate needs of that family. What if every member would see the need for unity and urgently solicit the physicians in his community to belong to and serve organized medicine at all levels participating a little more than just the bare citizenship requirements.

What if the dollar should be devalued to such a point that we gave up the concept of money and returned to a barter system, and we had to really evaluate what goods and services were in fact of value to other members of society. What if the barter system required a relative value index, and the FTC declared that a restraint of trade. What if everyone spent a little time studying geology, anthropology, and history to better place in perspective the immediate and emotional issues at hand. What if every county society picked an important issue which affected the practice of medicine or the health or environment of its citizens and took initiative in preparing position papers and conducting studies on issues that the State Organization might utilize to form a policy. What if we had a certificate of need process for every new law that was passed by every legislative body. What if they needed an appended environmental or economic impact statement. But what if it only applied to the laws that I wanted passed. What if I could get the President's Page in ahead of the deadline for MINNESOTA MEDICINE.

What if society would make some fundamental decisions about life and death and then would quit worrying about what percentage of that gross national product goes for health care. What if this country ran out of paper and who would be hurt most, government or medical organizations. What if every communications media story didn't usually have an angle and recognized that the public's right to know included also the opposing points of view and allowed equal time and fervor. What if I don't do this anymore.

What if government bureaus and agencies should coordinate their activities so that requirements of citizens and organizations would not be at cross purposes. What if society should make some decisions to resolve the conflicts between confidentiality, the public's right to know, privacy, responsibility, liability, and freedom. What if society could make plans, alternative plans, and stifle the urge to control

and regulate. What if bright young people in government were replaced with people with wisdom and a sense of history as prologue. What if we didn't have so many people outside of health care fields who knew so much about health care strategy. What if self-styled experts were required to have read more than one paper or article. What if people decided to do something about a problem before suggesting that someone else do something about it. What if all the physicians in Minnesota joined MINNPAC to collectively influence the composition of the elected official family in state and national government.

What if I promise not to do this anymore.



Robert S. Flom, M.D.
President
Minnesota Medical Association

Southern Minnesota Medical Association

Owatonna, Minnesota — September 23, 1978 — Holiday Inn

9:00 A.M.	Pneumovax, Pro and Con	Robert VanScoy, M.D. Rochester
9:10 A.M.	Enucleating Donor Eyes and Uses of Donor Eyes.	Ronald Linde, M.D. Northfield
9:20 A.M.	Coronary Artery Bypass Surgery: The Quality and Quantity of Life.	Richard Lillehei, M.D. Minneapolis
9:40 A.M.	Coronary Artery Bypass: A Private Hospital Experience.	John Culligan, M.D. St. Paul
10:20 A.M.	Post Myocardial Infarction Ventricular Septal Defect: Surgical Experiences in Four Cases.	William D. Kelly, M.D. W. R. Schmidt, M.D. Minneapolis
10:40 A.M.	Approach to Histologic Diagnosis of Pulmonary Sarcoidosis.	John McDougall, M.D. Rochester
11:00 A.M.	Progress in Pediatrics: Urinary Infections in Children Abdominal Trauma Lumps and Bumps	 G. B. Stickler, M.D. Donald R. Cooney, M.D. Robert L. Telander, M.D. Rochester
12:00 NOON	Lunch and Business Meeting	
1:30 P.M.	The Role of Gastroscopy in a Small Community	Phillip F. Wichmann, M.D. Owatonna
1:50 P.M.	Cast Brace Treatment of Humeral Shaft Fractures	Elmer W. Lippmann, Jr. M.D. Mankato
2:10 P.M.	Practical Approach to Diagnosis of Colon and Rectal Cancer: (Co-Authors: E. G. Balcos, M.D.; Carl E Christenson, M.D.; Stanley M. Goldberg, M.D.; Jerry L. Schottler, M.D.; and Howard M. Frykman, M.D.)	Frederic D. Nemer, M.D. Minneapolis
2:40 P.M.	Unusual Cause of Acute Abdominal Pain	Joseph S. Emond, Jr. M.D. Lakeville
2:55 P.M.	Clinical Utilization of the Prolactin Assay	Charles Abboud, M.D. Rochester
3:30 P.M.	"A Special Lecture" Why, How, and Future of High Speed Computerized Tomography of the Heart, Lungs and Circulation.	Earl Wood, M.D. Rochester

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Editor's Notebook

Conversations on the Future Shape of Health Care

"In my opinion, the most fruitful and natural play of the mind is conversation."
Montaigne

Starting with this issue of MINNESOTA MEDICINE, we are publishing three conversations in consecutive issues with Minnesota health care leaders. These leaders include: Doctor Robert Flom, general surgeon from St. Paul and President of the Minnesota Medical Association; Mister Carl Platou, President of the Fairview Community Hospitals, and Doctor Richard Simmons, a family practitioner in Bloomington and medical director of the Physicians' Health Plan. As readers and financial supporters of this Journal, you deserve to know why we are publishing these conversations and why we have chosen these particular three individuals.

Timing is Right

We are publishing these conversations because the timing is right to discuss the future shape of health care. After all, President Carter has just enunciated his ten principles for a National Health Care Plan:

1. THE PLAN should assure that all Americans have comprehensive health care coverage, including protection against catastrophic medical expenses.
2. THE PLAN should seek to avoid a system that would cause the poor to receive substandard care.
3. THE PLAN should assure that all Americans have freedom of choice in the selection of physicians' hospitals and health delivery systems.
4. THE PLAN should seek to reduce unnecessary health care spending and should include "aggressive" cost containment measures.
5. THE PLAN should be designed so that public and private expenditures for improved health benefits and coverage would be substantially offset by savings from greater efficiency in the health care system.
6. THE PLAN will require no additional federal spending until fiscal year 1983, and thereafter should be phased in gradually as economic considerations permit.
7. THE PLAN should be financed through multiple sources, including government funding and "contributions" from employers and employees.
8. THE PLAN should include a significant role for the private insurance industry, with appropriate government regulation.
9. THE PLAN should provide resources and develop payment methods to promote major reforms in the delivery of health care services.
10. THE PLAN should assure consumer representation throughout its operation.

These principles, it seems to us, are a cautious, step-by-step, general approach to a tough problem. This approach fits our thinking.

As Governor Jerry Brown of California has said: "I reject get-it-done, make-it-happen thinking. I want to slow things down so I understand them better." Carter's principles, basically a step-at-a-time approach, give us time (no federal spending until 1983) and room to organize a plan with enough inventiveness and flexibility to fit into the current system and to satisfy the profession, the public, and third party providers.

Shaping of Policy Going on Now

The shaping of health care policy is going on right now in Minnesota, without legislative pressure, and will probably have a lot more to do with the kind of medicine you practice than federal laws or principles.

Flom

Doctor Flom, for example, has played a strong hand in reorganizing the Minnesota Medical Association to make it a more powerful and relevant political force. In our conversation, he talks about how this reorganization has worked out, what is happening with the Association's Cost Commission, and why the leaders of organized medicine in Minnesota now have a closer working relationship with political decision makers.*

Platou

We chose to speak to Carl Platou because he has long been known as a mover, shaker, and visionary among hospital administrators. Since hospitals take about 40 percent of American health care dollars, we felt we ought to have the point of view of someone who understands the forces that move hospital board members and medical staffs. Mister Platou, as you will see, fervently believes in building on the strengths of hospitals — their locations, their traditions, and their current affiliations — rather than being bogged down by divisive problems that make it impossible for organizations to cooperate.

Simmons

We spoke to Doctor Simmons because he has been in a leadership capacity with the Physicians' Health Plan since its beginning. As you probably already know, the Physicians' Health Plan, an Independent Practice Association (IPA), now has 1250 physician members in the Metropolitan Twin Cities and will soon have 31,000 patient members. The success of this Plan has already caught the attention of AMERICAN MEDICAL NEWS,[1] "Twin Cities MDs Learn the Painful Truth about Prepayment," and MEDICAL ECONOMICS, "Beating HMOs at Their Own Game." Doctor Simmons was kind enough to tell us MINNESOTA MEDICINE has treated the story of the Health Plan in greater depth than the other two publications.

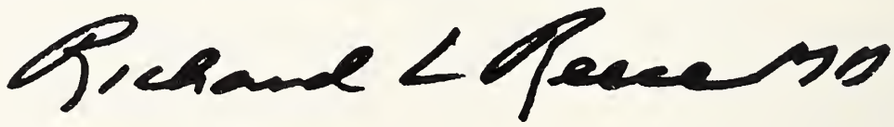
Our Opinion

In any event, we trust these conversations will give you a sharp idea of the shape of health care to come. In our opinion, health care leaders still have the power, time, and skills to help shape the kind of health care policy all of us can live with. If we can take the initiatives, build on the strengths of our situations and anticipate what the public wants, I believe future health policy can be negotiated without acrimonious controversies or apocalyptic debates.

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*See page 553.

Because of the financial restraints on MINNESOTA MEDICINE's budget and the space required for these three conversations, the Editor's Notebook will not appear in the October nor November issues.



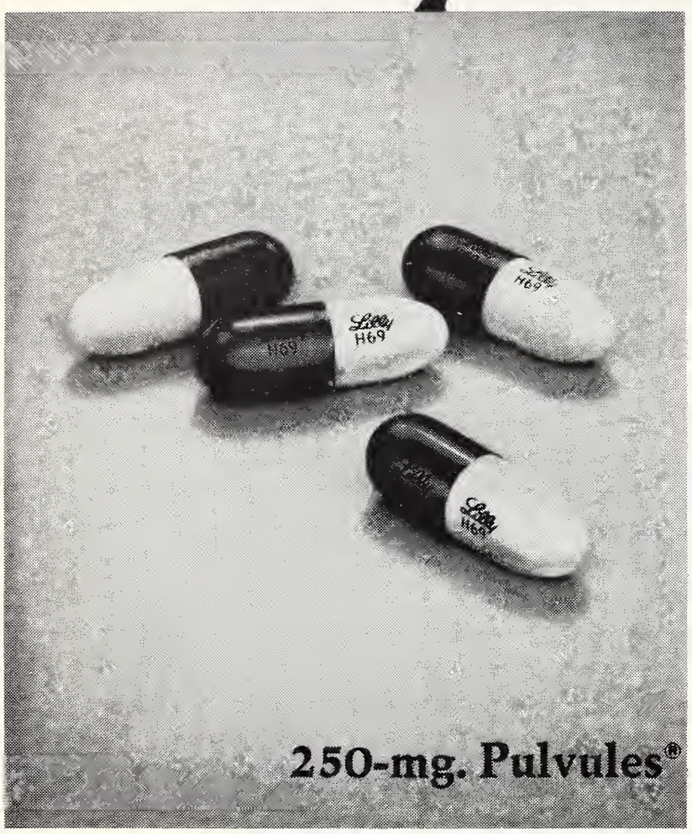
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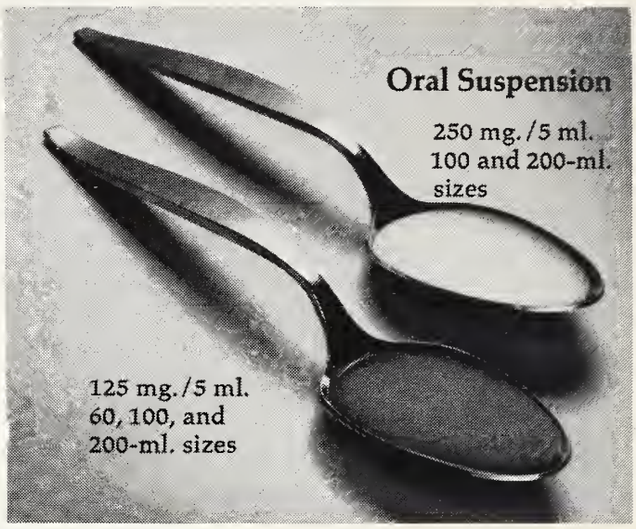
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2. Enright, S.B: Beating H.M.O.s at Their Own Game, Medical Economics pages, 97-111, July 10, 1978.

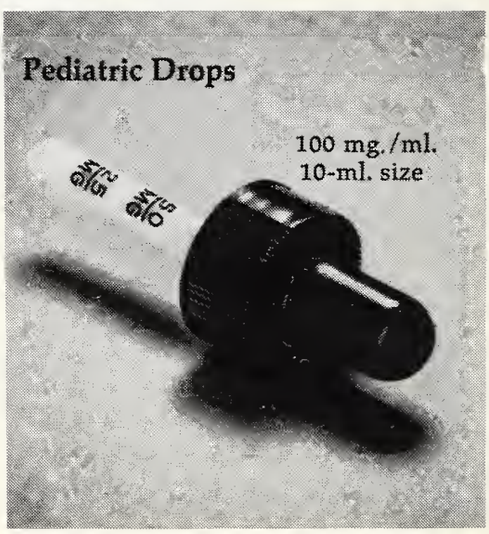


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Highlights of the Career of Dr. N. K. Jensen as a Thoracic and Cardiovascular Surgeon*

W. ROBERT SCHMIDT, M.D.†

DOCTOR N. K. JENSEN was born on March 3, 1910 in Rupert, Idaho. He attended college for three years at the University of Idaho in Mossow and also had a short period of training at the University of Washington in Seattle. Entering Washington University Medical School in 1931, he graduated cum laude in 1935. After a surgical internship at Barnes Hospital in St. Louis from 1935 through 1936 followed a special internship in pathology under the auspices of Washington University in the St. Louis City Hospital system in 1937. From 1937 to 1940 he was a resident in surgery at Minneapolis General Hospital. Joining the Army as a Captain in 1940 he became Chief of Surgery at Camp Crowder and subsequently served in the Surgeon General's office. Ultimately he was transferred to a hospital center in the Pacific theater and when the war ended, was discharged in March of 1945 with the rank of Colonel. Returning to Minneapolis he took a position as Assistant Professor of Surgery at the University of Minnesota and was assigned to the Dean's program at the Veterans Hospital. Within a relatively short period of time, at his request, he became a part-time consultant, essentially in charge of the thoracic surgical program at the Veterans Hospital and remained in this capacity until 1962.

At the time he became consultant, he began his practice in cardiovascular and thoracic surgery in Minneapolis in association with Doctor Thomas J. Kinsella. He was appointed as consultant in thoracic surgery to the state tuberculosis sanatorium at Walker, to the sanatorium at Duluth (Nopeming) and to the thoracic surgical services at Minneapolis General Hospital.

Doctor Jensen very quickly began to make major contributions in his chosen field. During the late 1940s, be became interested in and soon became an advocate of segmental resection in the treatment of pulmonary tuberculosis, since he was disturbed by the loss of pulmonary function by the standard forms of collapse therapy. He was an early advocate of decortication and re-expansion of the lung in the patient with tuberculous empyema, as opposed to the then more standard procedure of open drainage followed by total thoracoplasty. We still see an occasional patient in our office today who is able to live and breathe, who would long since have been dead of pulmonary insufficiency and right heart failure, if it had not been for Doctor Jensen's innovative approaches.

In the late 1940s he became interested in closed mitral valvotomy as initiated by Doctors Bailey and Harkens and soon began an extensive program in this field beginning at the Minneapolis Veterans Hospital and rapidly expanding the procedure to the various private hospitals in Minneapolis. He shortly thereafter felt there was a need for equipment to carry out cardiac catheterization studies in the Minneapolis private hospitals and persuaded the staff and administration of several Minneapolis hospitals to buy such equipment. While at the present time this seems hardly revolutionary, when Doctor Jensen first proposed purchasing this equipment, he was repeatedly told that those kinds of studies should only be carried out at places such as the heart hospital. He was one of the first surgeons in the community of private hospitals who was willing to perform such, then unusual operative procedures, as closure of the patient ductus, or correction of an aortic coarctation in the adult patient. He was one of the first surgeons in the community to see the need for and utilize apparatus for respiratory assistance, especially in the early postoperative period in the patient with reduced pulmonary function. He developed an early interest in the surgical correction of the patient with expanding thoracic aneurysm and was able to control some of these successfully by wrapping of the aneurysms with such materials as cellophane. Today these operations are outmoded, but those of us who had an opportunity to work with Doctor Jensen were at least very familiar with the problems posed by aneurysms prior to the development of modern techniques.

Doctor Jensen had a long standing interest in the surgery of coronary artery insufficiency. He started by investigating the operations suggested by Doctor Claude Beck of Cleveland and from there progressed to the use of the Vineberg operation and finally to the

*Presented at the Special Meeting of the Twin City Thoracic and Cardiovascular Surgical Society. December 5, 1977, Minneapolis, Minnesota.

†Minneapolis thoracic surgeon.

currently used aortic-coronary bypass procedures. Quickly he saw the need for more accurate anatomical delineation of the diseased coronary system and, shortly after the technique of coronary angiography was developed at the Cleveland Clinic, he persuaded Northwestern Hospital to install the necessary x-ray equipment to carry out coronary artery angiograms.

Despite all of his major pioneering contributions in the technical aspects of Thoracic and Cardiovascular Surgery, he will best be remembered for his role as a teacher.

Doctor Jensen was active in the Minneapolis Veterans Thoracic Surgical program until 1962. In addition, aided and abetted by Doctor Thomas J. Kinsella, Doctor Jensen organized a number of other training programs in thoracic surgery, utilizing clinical material from various sources, including Doctor Kinsella's extensive private practice and combining the programs with material from the surgical service at Glen Lake Sanatorium and the state tuberculosis sanatorium at Walker.

As a result of his efforts, at the present time there are Thoracic and Cardiovascular surgeons that he has trained now practicing their specialty in the Twin Cities, Mid-West and such wide spread areas as Belo Horizonte and Rio de Janeiro in Brazil to Vancouver and Calgary in Canada. Doctor Jensen retired in December of 1976 and died May 15, 1978.

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Operation on Four Cases of Ventricular Septal Rupture Complicating Myocardial Infarction*

WILLIAM D. KELLY, M.D.† and W. ROBERT SCHMIDT, M.D.†

The surgical management of four cases, two in the acute and two in the chronic phase, is presented. All survived without major complications and were discharged from the hospital. Three are currently surviving between 8-10 months and one patient has died of acute myocardial infarction.

MYOCARDIAL INFARCTION is complicated by rupture of the interventricular septum in about 0.5-1% of cases which means about 10,000 cases yearly in the United States. This complication usually produces a major hemodynamic burden in a sick heart leading to early death. Reports in the literature[1,2,8] indicate that about 25% of such patients die in the first day and between 50-60% are dead within a week of onset and 80-90% have died by two months. Since a sizeable proportion of such cases can be salvaged by surgical repair, the prompt recognition and management of this complication of myocardial infarction is important.

The typical clinical picture is that of an abrupt deterioration of the hemodynamic status of a patient in the first week or two after an acute myocardial infarction associated with the appearance of a systolic murmur over the precordium. More severe cases will develop shock, oliguria, anuria and expire in the first day or so, whereas others will show the sudden onset of congestive heart failure. Milder cases may occur with tachycardia and the gradual onset of congestive heart failure. The principal condition to be considered in the differential diagnosis is ruptured papillary muscle but since this highly lethal complication is also potentially correctable by operation, there is no need to differentiate prior to study in the heart catheterization laboratory. The definitive diagnosis is established by angiographic and oximetric demonstration of the fistula between the left and right ventricles.

Medical management is employed initially to control the congestive heart failure using the usual modalities of digitalis, diuretics, sodium restriction, oxygen, etc. In those instances of more dramatic deterioration with hypotension, oliguria and other evidences of cardiogenic shock, more unusual measures such as counterpulsation with the intra-aortic balloon catheter may be necessary to stablize the situation and permit diagnostic studies and preparation for surgery if this should appear feasible. In this regard the usual advice found in textbooks that operative risk is lowest when operation is delayed beyond 3-6 weeks must be viewed as a form of selecting the case with the lesser burden. Although the operative risk is higher in cases which must be operated upon early, there is still a significant survival rate in these cases, many of whom would otherwise die if efforts at medical management were continued in the face of progressive deterioration.

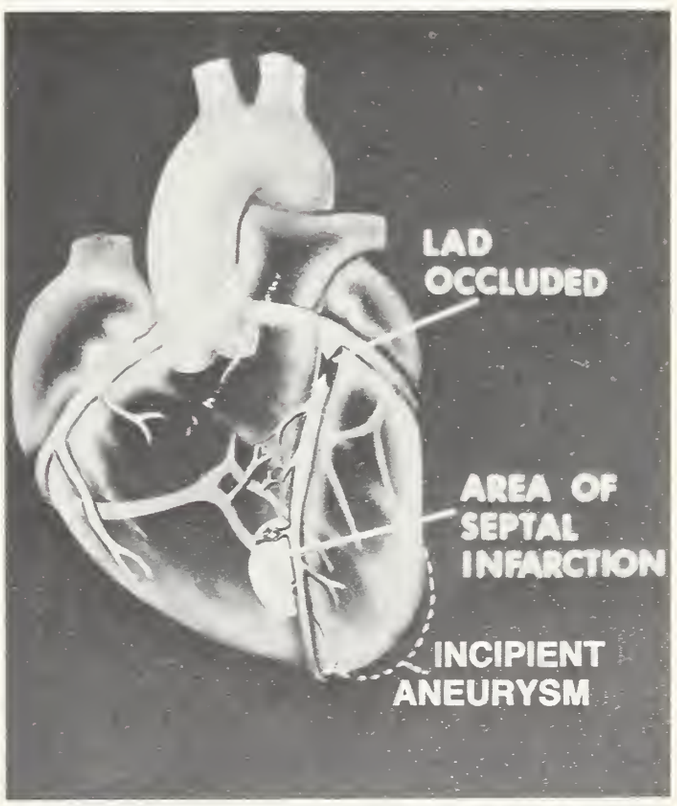


Fig. 1 — Infarction most often involves the apex of the left ventricle (incipient aneurysm) and the anterior septum.

*Presented at the Special Meeting of Twin City Thoracic and Cardiovascular Surgical Society. December 5, 1977, Minneapolis, Minnesota.

†Minneapolis thoracic surgeons.

Clinical Experience

The authors in their entire clinical experience have encountered four cases of rupture of the ventricular septum following myocardial infarction all occurring in the past year. Two patients were male, two female. The ages were 55, 65, 70 and 72 years. Two patients represented an acute mode of presentation and two were operated in the chronic stage with persistent and recurrent congestive heart failure. When seen prior to operation, all exhibited pulmonary congestion on chest Xray, and a holosystolic murmur over the precordium. Cardiomegaly was present in three cases with marginal cardiac enlargement in the fourth.

In two instances the intra-aortic balloon was inserted a number of days prior to surgery in the face of hemodynamic deterioration while under intensive medical therapy. In each instance the patient improved, permitting operation under more favorable and stable conditions. In a third case the intra-aortic balloon was inserted at operation as a precautionary measure and removed the following day.

The electrocardiogram showed evidence of old myocardial infarction in three instances (one anterolateral, two anterior and posterior) and in the fourth, non-specific ST-T wave changes suggesting possible acute inferior wall injury. Cardiac catheterization demonstrated the ventricular septal defect (VSD) in all four with shunt flows of 40, 60, 72, and 80% respectively. Two patients showed an apical ventricular aneurysm. Occlusion or significant stenosis of major coronary branches was demonstrated in all (1+ vessel disease in two cases, two vessel disease in one and three vessel disease in one).

The precise location of the VSD was obvious prior to surgery in the two patients with an apical left ventricular aneurysm but uncertain in the other two.

Operation was carried out using cardiopulmonary bypass in all and employing cold cardioplegia combined with aortic cross-clamping in three instances. In the two patients with an apical aneurysm the septal defect was located in the anterior septum near the apex and measured approximately 2 cm. in diameter. In both cases the aneurysm was opened widely, the VSD repaired by interrupted mattress sutures reinforced with Teflon felt pledgets, (Figures 1, 2, 3, 4) and the ventricular aneurysm repaired by approximating the remaining edges of scar employing two layers of interrupted sutures placed through strips of Teflon felt. In one patient an atrial septal defect incidentally discovered was also closed by suturing.

In the other two cases the location of the VSD was not apparent by external examination of the heart. The defect was located by making a small incision in the apex of the left ventricle and inserting a finger to inspect the interior. In each instance the defect was located posteriorly and relatively high on the ventricular septum. The defects were each approximately 3 cm. in diameter. In each case an incision was made high in

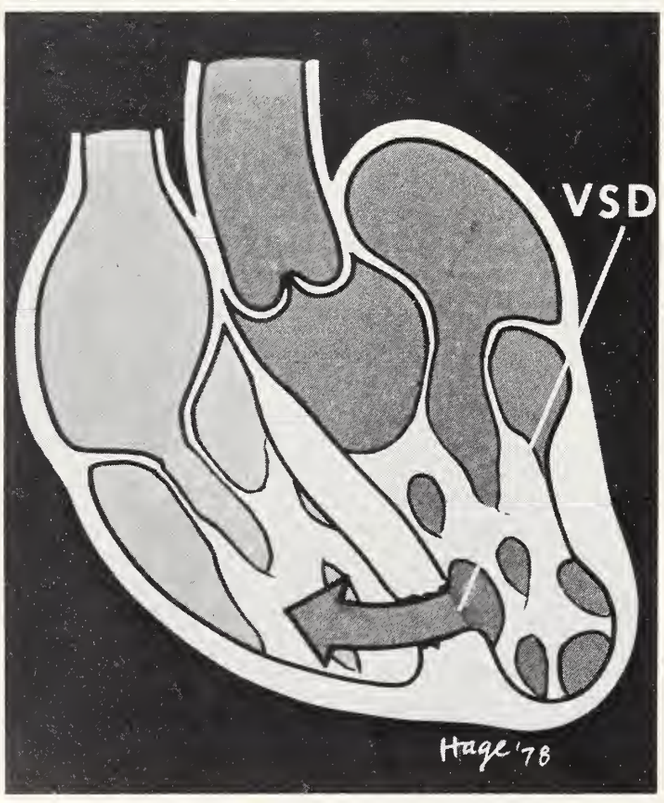


Fig. 2 — A large left-to-right ventricular shunt develops commonly with a major hemodynamic deterioration.

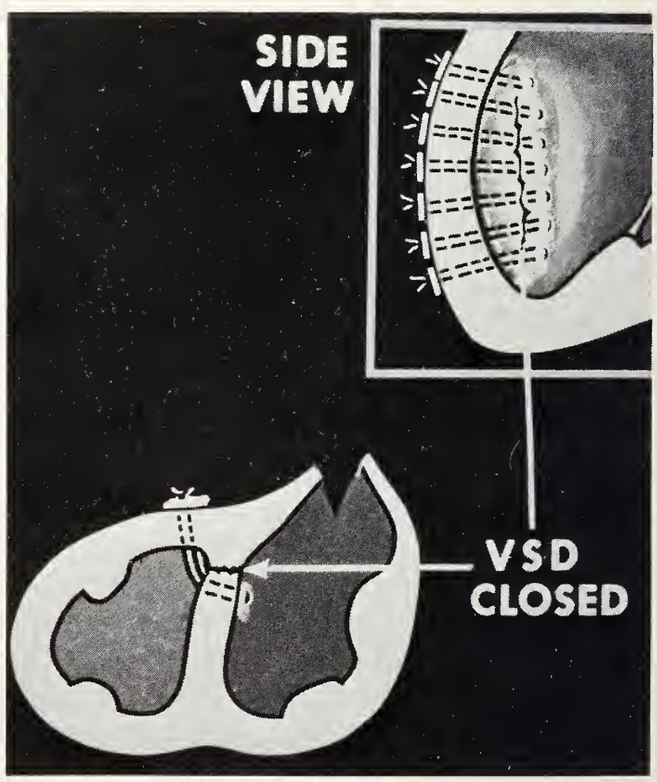


Fig. 3 — The septal defect here is most easily approached by incision in the associated apical aneurysm. When the defect is small Teflon felt reinforced mattress sutures are used to close it.

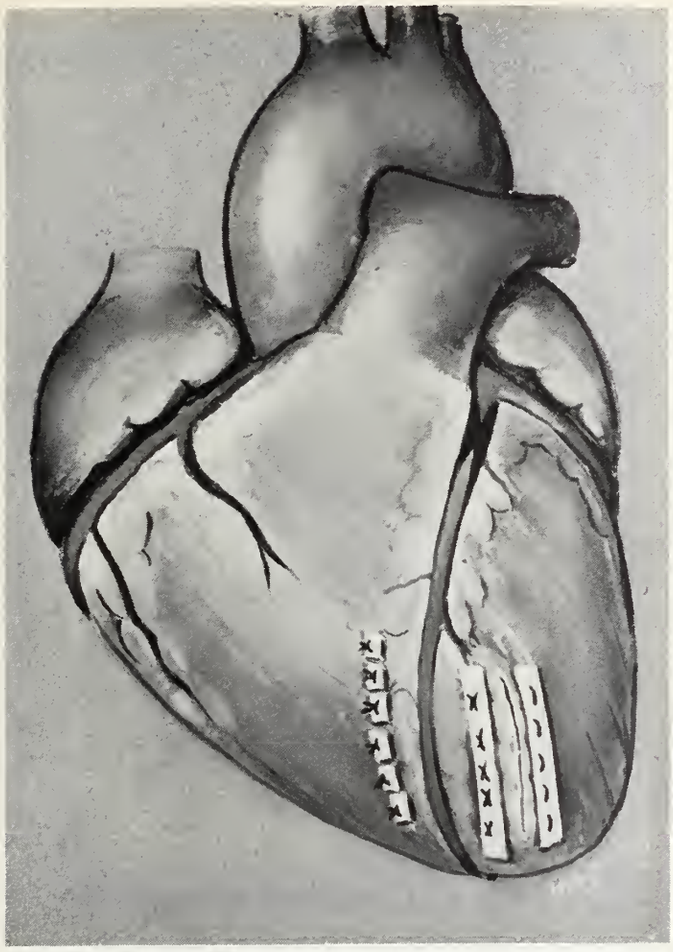


Fig. 4 — Repair of the aneurysm is with sutures passed through scar tissue at the juncture with viable myocardium and reinforced with strips of Teflon felt.

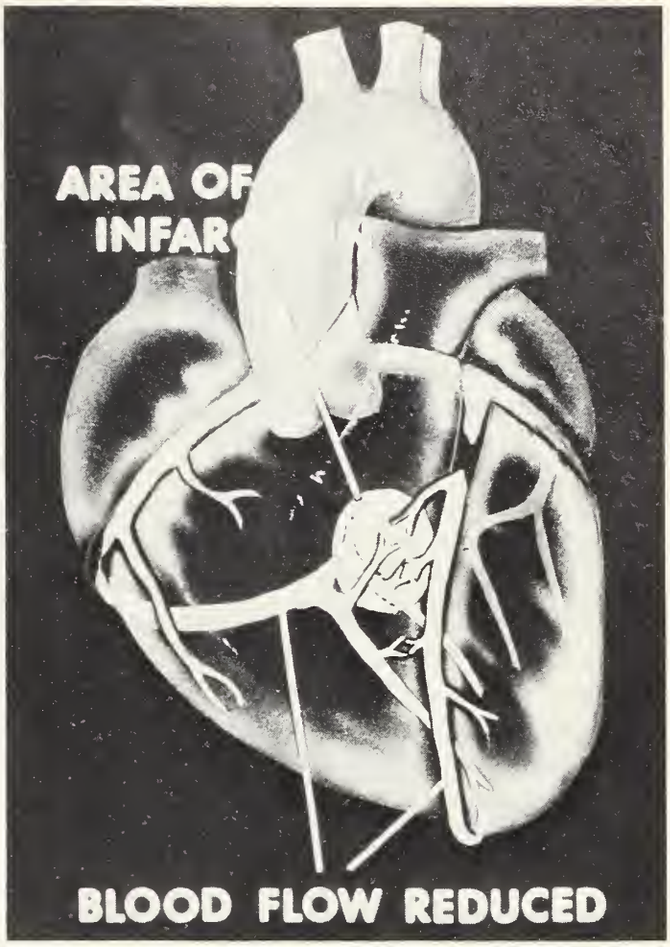


Fig. 5 — Less commonly infarction posteriorly in the septum can result in a septal defect. Collaterals from the circumflex coronary artery maintain viability of the posterior wall of the left ventricle.



Fig. 6 — The septal defect is located posteriorly and higher on the interventricular septum.

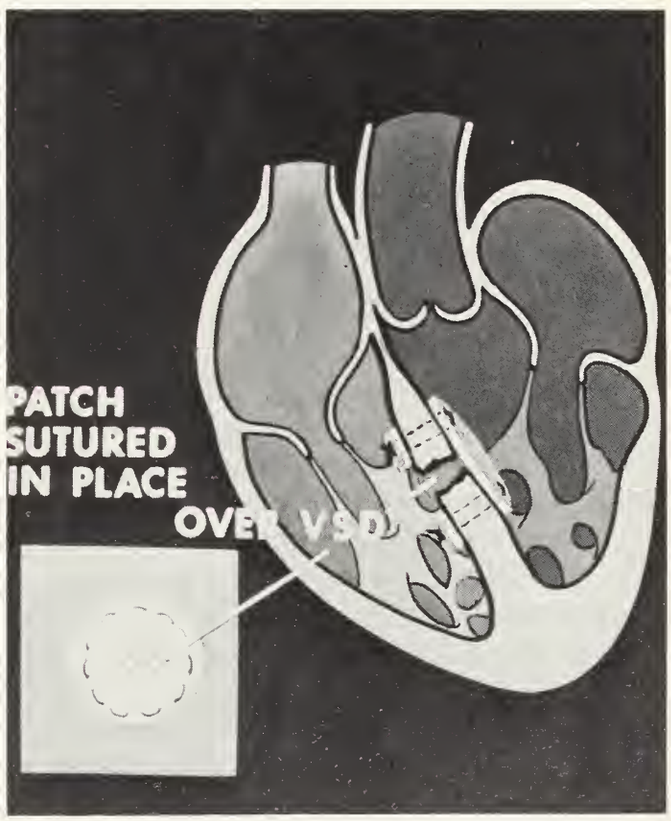


Fig. 7 — Here in the absence of an associated left ventricular aneurysm, the surgical approach is through the posterior right ventricle. The Teflon patch is sutured in place on the left ventricular side with mattress sutures of 2-0 Tevdek passed through the septum and tied over Teflon felt pledgets.

the posterior wall of the right ventricle adjacent to the ventricular septum and the defect repaired using a large patch of Teflon felt placed on the left side of the ventricular septum with interrupted mattress sutures passed through the septum and a second patch in the one case and uses pledgets of Teflon felt for reinforcement in the other (Figures 5,6,7,8). These patients also each received two saphenous vein bypass grafts, to the left anterior descending coronary and right coronary arteries in one case, and to the anterior descending and circumflex coronary arteries in the other.

Results

All patients showed a good hemodynamic status following operation and the postoperative course was relatively benign in all four cases. The two patients in whom an intra-aortic balloon had been inserted prior to operation had the balloon removed uneventfully 3-5 days after operation. All four patients survived and were discharged from the hospital on the 11th, 12th, 16th, and 26th postoperative day respectively. Post-operative complications, none of which was severe, included atelectasis, cardiac arrhythmia, urinary tract infection, and transient elevation of the blood urea nitrogen. None of the patients showed clinical evidence of a persistent septal defect.

Three patients are alive and doing well clinically at 8-10 months after operation. One patient developed an acute myocardial infarction in association with the onset of acute heart block 4 months after operation and died abruptly shortly after hospitalization. Autopsy revealed a fresh acute inferior wall infarct. The repair of the VSD which had been present in the anterior septum near the apex was intact. No bypass graft had been inserted in this patient.

Discussion

The surgical treatment of post-myocardial infarction ventricular septal defect was first reported by Cooley in 1957.[3] Since then operative efforts have been used widely, and it soon became apparent that the lowest surgical risk was seen in patients surviving 6 weeks or longer after the onset of ventricular septal rupture. As mentioned earlier, this can be viewed as a process of inadvertent selection, so that it would be a mistake to consider this period of elapsed time before proceeding to surgical intervention as a goal to be achieved at all costs in every case. It is clear that the majority of patients suffering ventricular septal rupture following myocardial infarction will probably die prior to this time even with the most intensive medical therapy, and therefore it is important to recognize and select for early operation those patients doing poorly or

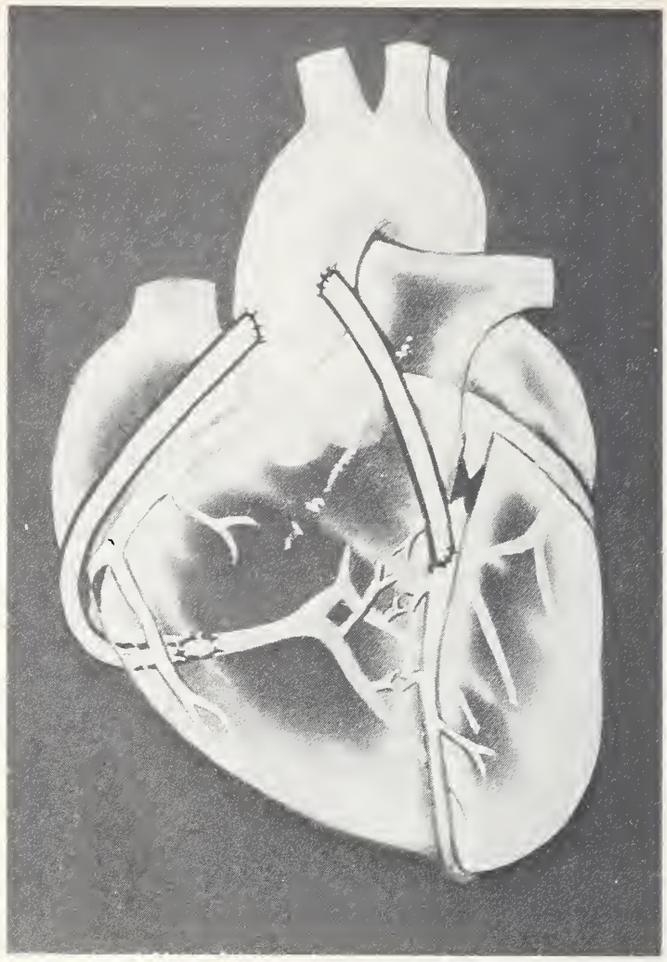


Fig. 8 — In this case bypass grafts are inserted into the L.A.D. and right coronary arteries to improve blood flow in these obstructed vessels supplying non-infarcted myocardium.

deteriorating while receiving optimal medical therapy. This decision is dependent on establishing the diagnosis conclusively by heart catheterization, of course, but the necessary steps leading to this point, including where necessary the use of counterpulsation with the intra-aortic balloon catheter, may depend on decisions made in the first hours or days after the onset of septal rupture.

Modification of the surgical approach to the ventricular septal defect by entering an infarcted or aneurysmal area generally at the apex of the left ventricle has been felt to offer better exposure and more effective repair of the septal defect.[5,6] Schumacker,[7] however, has pointed out that posterior septal defects are better approached posteriorly through the right ventricle as was done in our two cases.

In the most extensive experience from a single institution Daggett et al.[4] reported on 36 cases of post-infarction septal rupture treated surgically. In 21 patients operation was necessitated within the first three weeks with a mortality of 52%. In their most recent experience this figure has decreased to 30%. Of 15 patients operated upon after three weeks 14

survived (mortality 7%). There were five late deaths in their series, three due to cardiac and two to non-cardiac causes. Of 19 long term survivors eight were in New York Heart Association functional Class I (asymptomatic), 10 in Class II (symptoms with unusual exertion) and only one in Class III (symptoms with usual exertion). These authors felt that the principal factors in success were: (1) the preservation of left ventricular muscle by ventriculotomy through the infarcted area where applicable, (2) the use of counterpulsation with the intra-aortic balloon catheter to support deteriorating hemodynamics, and (3) correction of associated problems such as coronary artery obstruction with vein graft and mitral insufficiency with valve replacement. Deferring operation until three weeks or longer after onset is desirable to permit scarring and more favorable circumstances for suturing provided the hemodynamic and general status of the patient can be well maintained.

Summary

Rupture of the ventricular septum is an infrequent but highly lethal complication of myocardial infarction. Intensive medial therapy may control the severe congestive heart failure that usually ensues in which case operative repair is most favorable after a delay of three weeks. However, the majority of patients show progressive and frequently rapid hemodynamic deterioration prior to three weeks and will die if medical therapy alone is persisted in. Early operation, frequently with the support of intra-aortic balloon counterpulsation, can salvage a substantial number of those cases.

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Harold A. Diehl Award

The committee for the Diehl Award given annually by the Minnesota Medical Alumni Association solicits nominations for this award from the physicians of Minnesota. The award is presented to one or more physicians meeting these four major criteria.

1. Preferably an alumnus of the University of Minnesota Medical School.
2. Not engaged in an academic capacity.
3. Has made outstanding contributions to the Medical School, the University, the Alumni, and the community.
4. Has had a relatively long experience in the field of medical science or a related field.

Nominations for the May 1979 awards should be sent immediately to:

Konald A. Prem, M.D., Chairman,
Harold A. Diehl Award Committee
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Detailed supporting documents are necessary to consider nominees, but these can be forwarded later.

Left Atrial Myxoma

Surgical Experience

ÖRN ARNAR, M.D.,* W. R. SCHMIDT, M.D.,* JOSEPH J. GARAMELLA, M.D.,* MICHAEL F. LYNCH, M.D.,* AYDIN M. BILGUTAY, M.D.,* and WILLIAM D. KELLY, M.D.*

Our experience with five patients with a left atrial myxoma is presented. Diagnosis of the tumor may be extremely difficult to make, because of varied clinical presentation. Once diagnosis is established prompt surgical intervention is mandatory, since sudden death is a common clinical manifestation. Complete excision of the tumor including its pedicle on cardiopulmonary bypass is stressed in order to prevent recurrence.

MYXOMA IS the commonest intracavitary tumor of the heart. About three fourths of all myxomas are found in the left atrium. Myxomas have also been described in the other cardiac chambers and on the heart valves as well.[1,2,3] Women are affected more commonly than men. The tumor is rare in childhood. Prompt recognition and treatment of this tumor is emphasized by the fact that frequently the first clinical manifestation is sudden death. Although some authors believe that myxomas can arise from mural thrombi, local recurrence and the appearance of distant metastases attest to their neoplastic origin.[4,5]

Left atrial myxomas arise usually from the septum close to the fossa ovalis. Grossly the tumor is a gelatinous, friable mass attached to the septum by a pedicle (Figure 1). The friability of the tumor explains its propensity to embolize.

Presented at the Special Meeting of the Twin City Thoracic and Cardiovascular Surgical Society, December 5, 1977, Minneapolis, Minnesota.

*Minneapolis thoracic surgeons.



Fig. 1—Left Atrial Myxoma Removed at Operation.

Diagnosis of left atrial myxoma may be difficult to establish due to its protean manifestations. The symptoms are related to obstruction, embolism, or the systemic effects of the tumor. Syncope; episodic pulmonary edema of unexplained etiology, especially if dramatically relieved by changes in posture; stroke or peripheral embolism in a young patient, especially if sinus rhythm is present; all should alert the physician to the possible presence of left atrial myxoma. Histologic examination of removed peripheral emboli will sometimes confirm the diagnosis. A clinical picture suggesting subacute bacterial endocarditis with sterile blood cultures and systemic illness with fever, anemia, and weight loss is also seen.

Since the tumor may cause mitral stenosis and/or insufficiency, primary mitral valve disease is frequently confused with left atrial myxoma. Before the common availability of facilities for heart catheterization and angiocardiography the diagnosis was sometimes made by an unsuspecting surgeon exploring the left atrium prior to closed mitral commissurotomy.

Echocardiography has proven to be a superior, non-invasive test for atrial myxomas.[6] Heart catheterization and angiocardiography confirm the presence of the tumor and define associated conditions such as mitral insufficiency. The definitive treatment of left atrial myxoma was initiated in Sweden by Crafoord in 1954.[7] Since then multiple reports have appeared.[8,9]

Material

Our experience comprises five patients, three women and two men (Table). The spectrum of symptoms varied from atypical mitral valve disease, to symptoms suggestive of subacute bacterial endocarditis. Echocardiography, angiocardiography, and

TABLE
Our Experience

Patient	Sex	Age	Symptoms	Results
1	F	51	CHF SBE	Excellent
2	F	34	SBE	Excellent
3	M	50	Atypical Mitral Regurgitation Previous CVA	Excellent
4	F	49	Atypical M.S.	Excellent
5	M	54	Atypical M.S.	Excellent

heart catheterization were done in all patients, except the first one, where the diagnosis was made by finger exploration prior to a planned mitral commissurotomy (Figures 2,3,4).

In all cases the surgical treatment consisted of complete excision of the tumor, including its pedicle on cardiopulmonary bypass. One patient required a patch closure of the defect in the atrial septum due to the sessile nature of the tumor. The remaining four patients had primary suture closure of the defect. All the patients survived the operation and have shown no evidence of tumor recurrence or distant metastases.



Fig. 2—Left Ventriculogram in systole Shows Myxoma in Left Atrium.

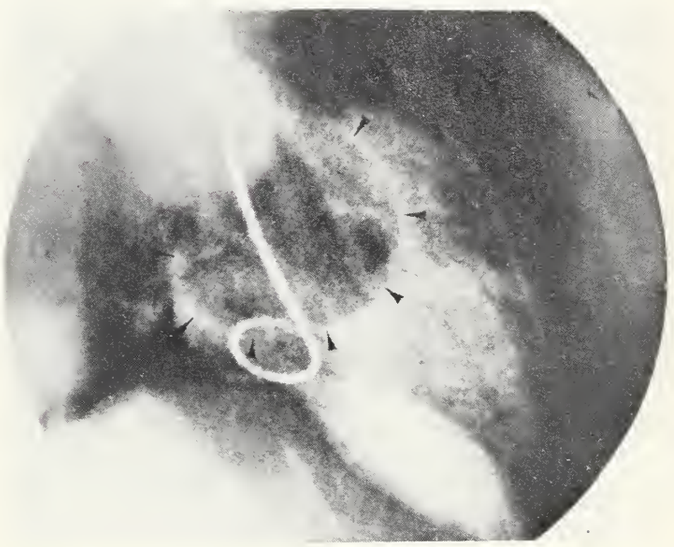


Fig. 3—Left Ventriculogram in Diastole Shows Myxoma Prolapsing Through the Mitral Valve.

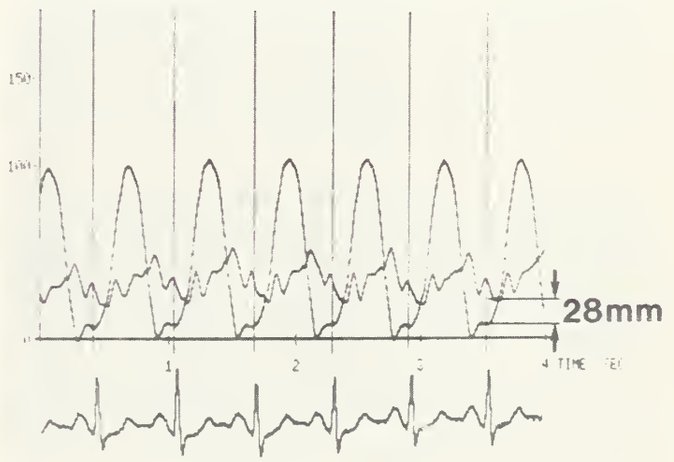


Fig. 4—Simultaneous Tracing of Pulmonary Artery Wedge Pressure and Left Ventricular Pressure Shows a 28 mm. Gradient Across the Mitral Valve.

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Self-monitoring Pacemaker Function with Pace-Pulse Trac

AYDIN M. BILGUTAY, M.D.* ILHAN BILGUTAY, M.D.* and JOSEPH J. GARAMELLA, M.D.*

Currently available pacemaker surveillance by office visits, pacemaker clinics, or transtelephonic monitoring is not entirely adequate. It is costly and impractical. We have introduced "self monitoring" for pacemaker patients using "Pace-Pulse Trac", which allows for more frequent monitoring, early detection of malfunction, reduced office visits and extended end-of-battery life, reduced number of operations and economic benefit.

DESPITE EXTREME CARE and quality control at every stage of production of pacemakers, a small yet significant number of pacemakers malfunction either because of component failure or premature battery failure. Malfunction due to electrodes or increased thresholds also occurs, requiring close follow-up. Currently office visits, pacemaker follow-up clinics[5,7] and transtelephonic monitoring of pacemaker function[3,4,6] are not entirely adequate. They are relatively costly[3,8,9] by some standards, and relatively impractical.

Instructing the patient to take his pulse two or three times a day is a crude and indirect way of checking pacemaker function, but it allows monitoring more frequently and in essence constitutes a major part of the usual follow-up program. This responsibility, however, is often ignored, not appreciated, or is beyond the capabilities of the patient. Thus although the major part of the follow-up program is delegated to the patient, this (the patient's part of monitoring) is often not reliable.

Since most pacemaker malfunctions can be detected by relating changes in pacer and pulse rates (Table 1), it was reasoned that if the information on these parameters could be provided to the patient reliably by a unit at his disposal, in terms he could understand and interpret, unlimited chances of monitoring at more frequent intervals would be provided to the patient. Therefore the opportunity would be greater for better follow-up to pick up pacemaker malfunction. Thus, emphasizing self-monitoring initially we have developed Pace-Trac.[1,2] The three-year experience with this unit has led to further development and combination of this unit with a Pulse-Trac module to make self-monitoring easier and more reliable.

TABLE 1
Pacemaker Malfunction as Detected by Changes in Pacer and Pulse Rates

Malfunction due to	Pacer Rate	Pulse Rate
Component failure	↑ or Variable	↑ or Variable
Battery failure	↓	↓
Electrode failure		
Displacement	→	↓
Fracture	→	↓
Myocardial perforation	→	↓
Increased myocardial threshold (Exit block)	→	↓

↑ — increase in rate
→ — no change in rate
↓ — decrease in rate

Pace-Pulse-Trac is a computerized, hand held, digital unit, capable of receiving and displaying pacemaker impulses and pulse rates simultaneously from the body surface and fingertip, respectively (Figure).

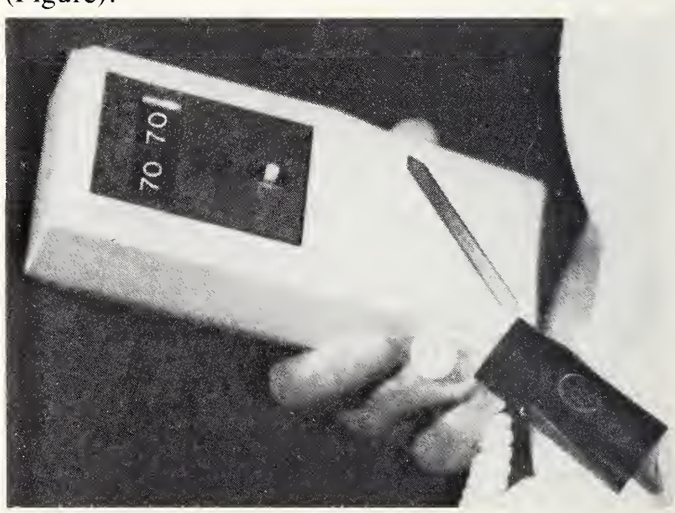


Figure 1 — Picture showing use of Pace-Pulse-Trac by patient.

*Minneapolis thoracic surgeons.

Presented at the Special Meeting of Twin City Thoracic and Cardiovascular Surgical Society. December 5, 1977, Minneapolis, Minnesota.

Method

One hundred patients receiving implantations of various pacemakers* were followed between January 1974 and January 1977. Patients were given a Pace-Pulse-Trac immediately after pacemaker implantation and were instructed on how to use and check their pacemaker function according to the chart shown below (Table 2).

TABLE 2

Evaluation of a Demand Pacemaker with Initial Rate of 70

Pace-Trac	Pulse	Pacemaker Function
70	70	O.K.
No Reading — or 70 with Magnet	More than 70	O.K.
70	More than 70	See Doctor
70	Less than 70	See Doctor
65 or less	65 or less	See Doctor
75 or more	75 or more	See Doctor

They were asked to use their Pace-Pulse Trac two or more times a day. They were followed for a total of 1449 patient months.

Results

Six patients have detected electrode displacements, three component failures and three dead batteries, ten days to six months after discharge. Seven patients have detected premature depletion of batteries before the expected two years, whereas thirty patients could delay battery change from the 26th to 41st month by self-monitoring until the warning signal of eminent battery depletion (rate drop to 65 ppm. or below) (Table 3) was detected.

*Medtronic, Cordis, GE, CPI, Intermedics, Stimtech, Siemens, Starr Edwards, Vitatron.

TABLE 3

Pacemaker Malfunction Detected by Patients through Self-Monitoring with Pace-Pulse Trac 100 Pts. Jan. 1974 to Jan. 1977

Battery failure		40
Reduction in rate		
Before 6 mo.	3	
Before 24 mo.	7	
After 24 mo.	16	
After 30 mo.	14	
Component failure		3
Electrode displacement		6
Generator-electrode junction failure		8
Exit block		1

All pacemakers in this study were expected to last 24 months. They all showed evidence of impending failure before or after 24 months. No "routine replacements" of impulse generators were done at 24 months.

Using Pace-Pulse-Trac: Patients' stays in the coronary care units have been cut down from three to four days to one to two days. Office visits likewise during the observation period of 1449 patient months were 119 instead of otherwise would-be scheduled 441 visits.

Conclusions

Self-monitoring with Pace-Pulse-Trac allows more frequent monitoring, earlier detection of malfunction, reduced numbers of office visits, fuller utilization of battery life, reduced numbers of operations and other economic benefits. Recently we have incorporated pulse-width detection from the body surface in addition to impulse and pulse rates.

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Minnesota Medical Association
1979 Annual Meeting
May 17-18 — Radisson St. Paul

Centrifugal Blood Pumping for Open Heart Surgery

MICHAEL F. LYNCH, MD.*; DONOVAN PETERSON, B.A.†; and VERNE BAKER, A.A.S.‡

Post operative chest drainage has been recognized as a relatively good index of hemostasis following open heart surgery. In a consecutive series of patients using a new torroidal heart pump, post operative chest drainage was found to be significantly decreased when compared to a similar consecutive series of patients using a traditional roller pumping system.

THE TORROIDAL HEART pump for cardiopulmonary bypass was born of research for an artificial heart, a human heart substitute, and is more than an evolution of previous successive hydrolic pumps used for the purpose of propelling blood from an oxygenator to a patient. Previous pumps have included the Dale Schuster pump, seen most often in the animal laboratories of the 1940s, the multicam sigmamotor pump, the "old reliable", used in the operating room at the dawn of clinical open heart surgery in the 1950s, and the various models of roller pumps, the "work horse" of heart surgery pumps in the 1960s and 1970s. The Torroidal pump involves an entirely new concept for non-traumatic and fail-safe circulation support.

The Torroidal pump used in our clinical experience was the Bio-Pump#, developed by Kletschka and Rafferty, which operates on the constrained vortex principle. During cardiopulmonary bypass, blood is driven through the arterial line and returned to the patient by centrifugal forces generated within the pump. These centrifugal properties of the Bio-Pump have three beneficial physical aspects. First, the pump deprimes itself if large amounts of air enter the pump. For example, if the oxygenator reservoir is allowed to empty, pumping ceases. Secondly, if smaller amounts of air enter the pump they are displaced by their low density to the center of the vortex. These two properties make it virtually impossible to produce air embolization during cardiopulmonary bypass as a result of a faulty blood pumping system. Thirdly, since the pump is not a positive displacement device, the

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#Bio-Medicus, Inc., Minnetonka, MN 55343.

Presented at the Special Meeting of the Twin City Thoracic and Cardiovascular Surgical Society. December 5, 1977, Minneapolis, Minnesota.



Fig. 1(A) — Bio-Pump.

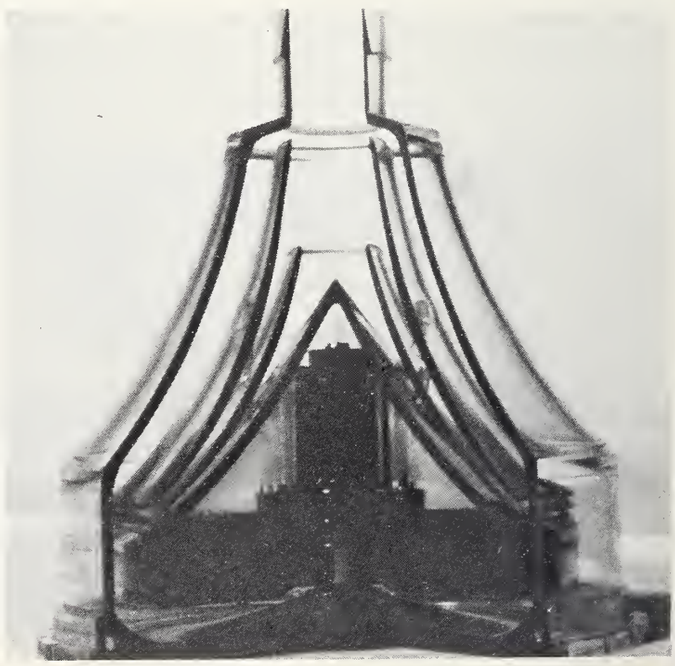


Fig. 1(B) — Cutaway model.

load sensitive characteristics of the Bio-Pump make it resistance dependent. Forward propulsion of blood stops immediately if the arterial line become kinked, obstructed, or occluded inadvertently. This prevents the generation of excess line pressures leading to disruption of connections, adapters, and fittings.

Focal microscopic infarcts of the brain and other organs have been reported in patients with early and late deaths following cardiopulmonary bypass. Emboli have been implicated as the cause of these findings. An important potential source of such microembolizations relates to the spallation of plastic tubing particles into the lumen of the conduits of these pumping systems through erosion and fatiguing action of the roller on the tubing in the pump head. The Bio-Pump avoids such spallation problems of roller pumping systems, whether the plastic tubing be Silastic, polyvinyl chloride or polyethylene. The Bio-Pump also avoids the problems of splitting and cracking of the tubing that have occurred as a result of fatiguing action of the roller pump. Splitting and cracking can result in air embolization.



Fig. 1(C) — Bio-Pump in housing.



Fig. 2 — Embolic debris from polyvinyl chloride tubing with roller pumping.*

*Hubbard, et al., "Spallation using Roller Pumps and its Clinical Implications." Speech, Annual meeting of Society of Artificial Organs, State of Washington, 1975. (By permission.)

TABLE

Comparison of Chest Drainage
Vortical Pump vs. Roller Pump
Consecutive Cases
Q-200 Bentley Oxygenators
Hemodilution Prime
Cardiotomy Suction Returned to Pump Reservoir

	Roller Pump 48 Cases (Prior to 5/76)	Vortical Pump 92 Cases (5/76-11/77)
Pump Time Average	133 Minutes	154 Minutes
Hematocrit Study Beginning Bypass Average	29.2	26.4
Chest Drainage Over 24 Hour Post Surgery Interval	19.56cc/hr/m² (avg) 7.0-85.0cc/hr/m² (rng)	13.8cc/hr/m² (avg)
Plasma Hemoglobin Samples Taken at Beginning and End of Bypass	61.3mg%rise/hr of Pump Time (avg) 9,5-384.4mg%/hr (rng)	36.4%rise/hr of Pump Time (avg)

We have used the Bio-Pump since May of 1976, both in a pulsatile and in a non-pulsatile mode. We have attempted to study its atraumatic qualities in a consecutive series of patients. Blood loss is monitored as postoperative chest tube drainage.

Zuhdi has reported that postoperative chest drainage is a relatively good index of overall hemostasis. Considering all parameters, such as surgical procedure, type of oxygenator priming mixture, temperature, and the amount of use of cardiotomy suction, etc., to be closely parallel we have compared the postoperative chest drainage in a consecutive series of patients undergoing open heart surgery using the Bio-Pump with a prior series of patients using a roller pump at the recommended fittings. The Table shows less postoperative drainage in the Bio-Pump patients as compared to the roller pump patients and the difference was felt to be statistically significant.

It is felt that the development of a Torroidal blood pump, such as the Bio-Pump, adds a new advance in atraumatic fail-safe blood pumping for open heart surgery.

Continuing Medical Education

Q and A — CME

Questions from Minnesota Physicians Concerning Continuing Medical Education may be Addressed to:

MMA Committee on Medical Education
Suite 900
101 East 5th Street
St. Paul, MN 55101

Those answered in MINNESOTA MEDICINE are the most common or the most appropriate to a specific time. Queries from individuals will be answered as rapidly as possible only if a self-addressed stamped envelope is enclosed.

Q. Some of the physicians in my group are still a bit mixed up after the CME mailing from the Minnesota State Board of Medical Examiners. Where may we direct some questions to the Board?

A. As with any new program individual questions arise that nevertheless may fall into similar groups. Minnesota physicians should feel free to write the Board for specific answers, but it is hoped that this column will shortly present the Board's replies to questions of a like kind. These replies in amplification of the recent mailing will be especially useful as the first reporting period early 1979 nears. Questions may be mailed to the Board, or if received by MMA, will be forwarded to them.

Q. Are there any special training programs for helping smaller hospitals develop a meaningful CME staff program?

A. There are relatively few programs specifically designed to help organize a teaching program geared to area prospects. MMA's Subcommittee on Accreditation has a pre-survey function that will offer some assistance. In the fairly near future a seminar on education in hospitals will be presented by MMA. This "saturation" course will be announced to all hospitals as soon as plans develop and should assist materially in the construction of a soundly based CME program.

Q. How can I get the syllabi used at the Minnesota Medical Association's May Scientific Assembly in Duluth? Does reading those count for CME?

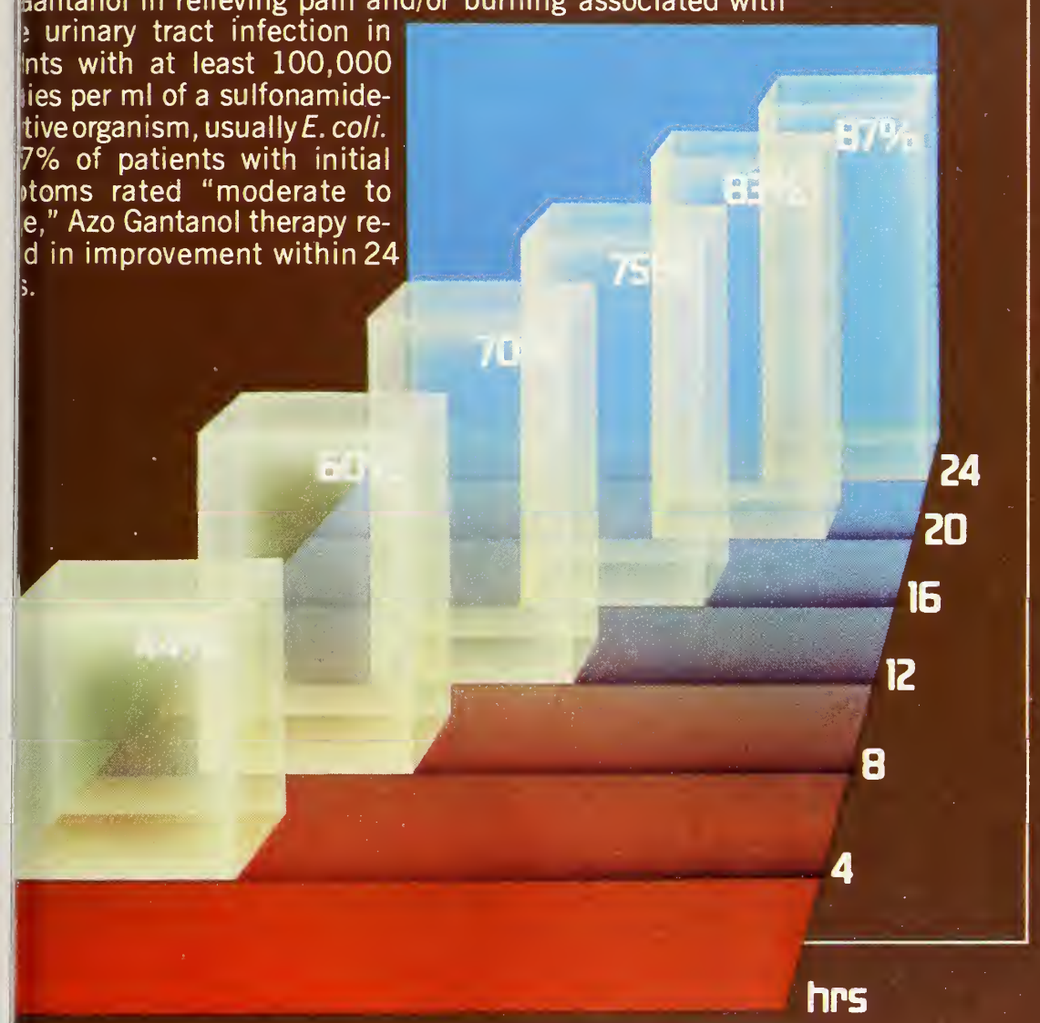
A. Syllabi are no longer available. However, as a service to Minnesota physcians who were unable to attend the excellent Duluth meeting, ***Minnesota Medicine*** *will consider publishing a number of the syliabi. Personal study of these educational materials will qualify on an hour-for-hour basis as Category V CME (AMA-PRA and State Board). Physicians attending the "live" presentations had additional structured educational opportunity. Attendance at the courses may be counted as Category I CME.*

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

portant data on the pain of acute cystitis:

87% of patients tudied [303 of 349], zo Gantanol® reduced ain and/or burning ithin 24 hours*

ntrolled, multicenter study assessed the efficacy of Gantanol in relieving pain and/or burning associated with e urinary tract infection in nts with at least 100,000 ies per ml of a sulfonamide-tive organism, usually *E. coli*. 7% of patients with initial toms rated "moderate to e," Azo Gantanol therapy re-d in improvement within 24 s.



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Contraindications: Children below age 12; sulfonamide hypersensitivity; pregnancy at term and during nursing period; because Azo Gantanol contains phenazopyridine hydrochloride it is contraindicated in glomerulonephritis, severe hepatitis, uremia, and pyelonephritis of pregnancy with G.I. disturbances.

Warnings: Safety during pregnancy not established. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been reported and early clinical signs (sore throat, fever, pallor, purpura or jaundice) may indicate serious blood disorders. Frequent CBC and urinalysis with microscopic examination are recommended during sulfonamide therapy.

Precautions: Use cautiously in patients with impaired renal or hepatic function, severe allergy, bronchial asthma; in glucose-6-phosphate dehydrogenase-deficient individuals in whom dose-related hemolysis may occur. Maintain adequate fluid intake to prevent crystalluria and stone formation.

Adverse Reactions: *Blood dyscrasias* (agranulocytosis, aplastic anemia, thrombocytopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia); *allergic reactions* (erythema multiforme, skin eruptions, Stevens-Johnson syndrome, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis); *G.I. reactions* (nausea, emesis, abdominal pains, hepatitis, diarrhea, anorexia, pancreatitis and stomatitis); *CNS reactions* (headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo and insomnia); *miscellaneous reactions* (drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L. E. phenomenon). Due to certain chemical similarities with some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia. Cross-sensitivity with these agents may exist.

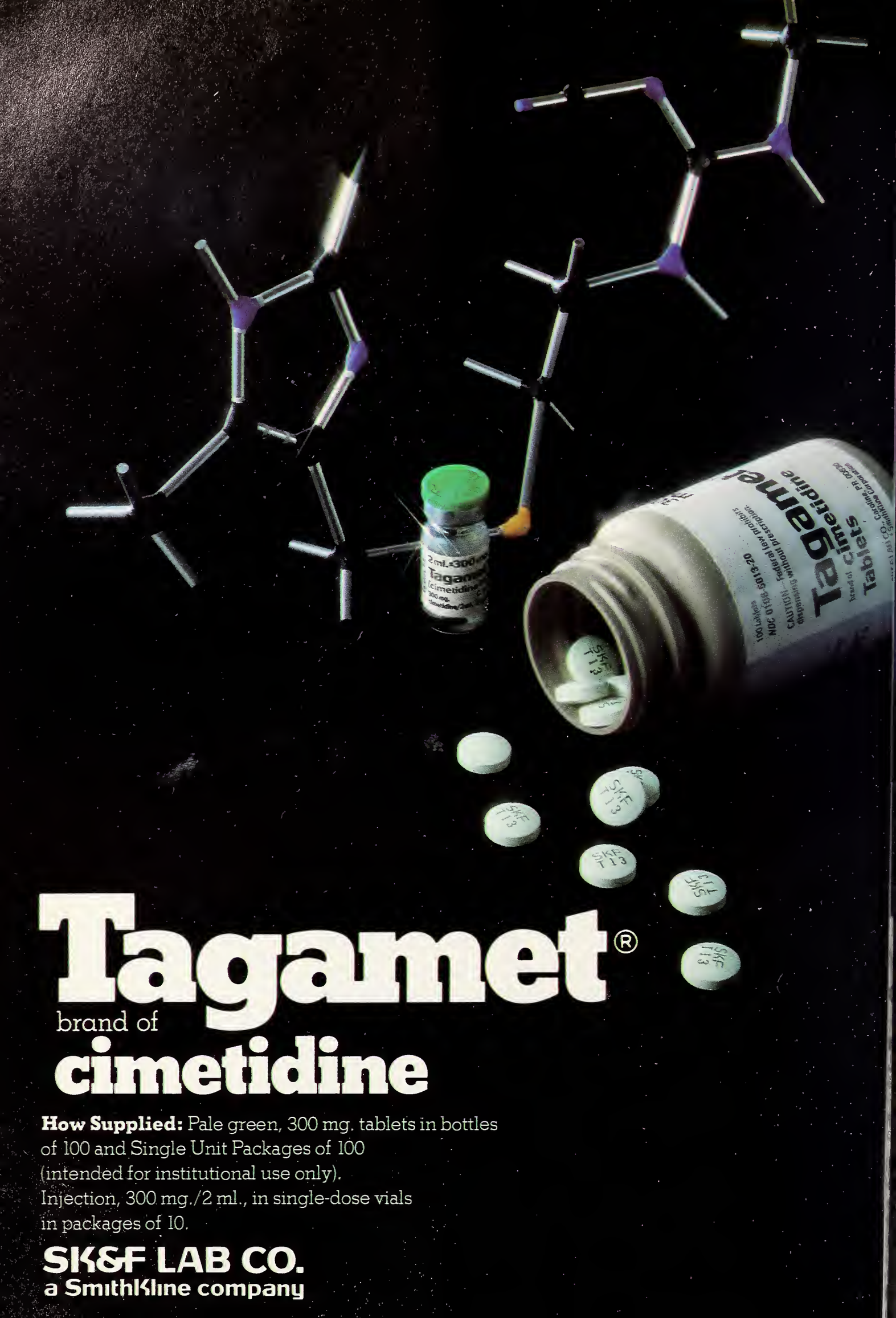
Dosage: Azo Gantanol is intended for the acute, painful phase of urinary tract infections. *Usual adult dosage:* 2 Gm (4 tabs) initially, then 1 Gm (2 tabs) B.I.D. for up to 3 days. If pain persists, causes other than infection should be sought. After relief of pain has been obtained, continued treatment with Gantanol (sulfamethoxazole) may be considered.

NOTE: Patients should be told that the orange-red dye (phenazopyridine HCl) will color the urine.

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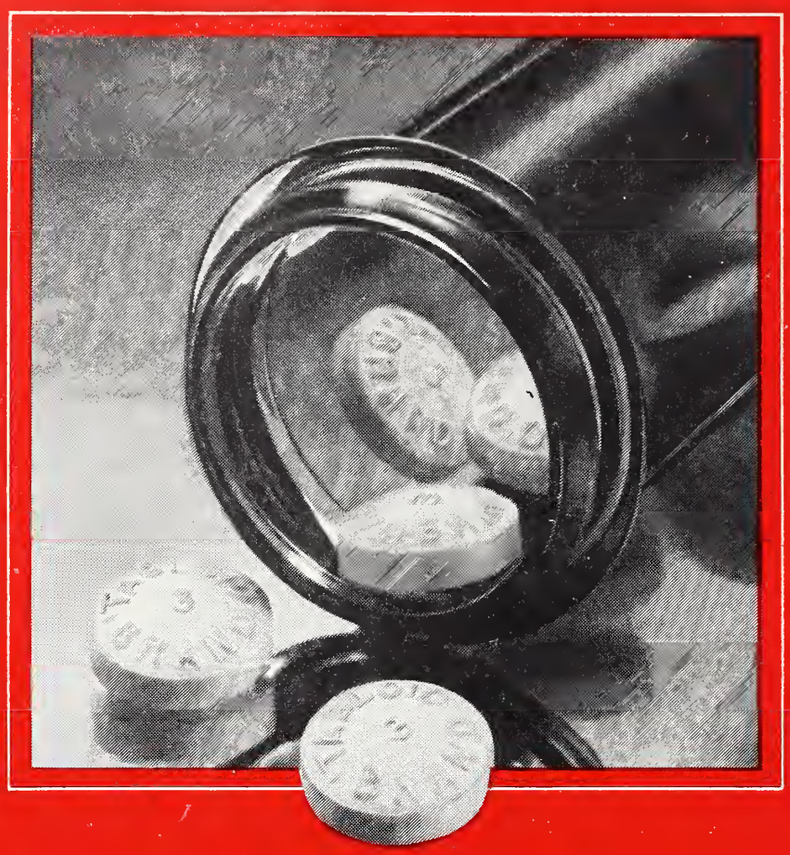
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The Cardiac Research Committee after Twenty Three Years*

JOSEPH J. GARAMELLA, M.D., PH.D.†

A historical account of the development, growth and activities of the Cardiac Research Committee (CRC) of Minneapolis is presented. Initially established as an organization to promote cardiovascular research, teaching and education of medical and paramedical personnel. The Committee (CRC) now primarily provides clinical services for cardiac surgery to community hospitals. In addition the Committee (CRC) conducts a two year curriculum for the training of extra-corporeal perfusionists.

Special tribute is given to one of the founding fathers: Doctor Nathan Kenneth Jensen.

"IF THE PAST IS non-existent and the future is not yet, and the present is fleeing moment by moment into the non-existent past, there is in fact no reality." Stated differently by Santanyana, "He who would not learn from the mistakes of history is sentenced to relive them", and therefore, the need for historical review.

The founding, growth and progress of the Cardiac Research Committee (CRC) of Minneapolis to a large measure parallels the development and growth of cardiac surgery in the metropolitan community hospitals which it serves. Perhaps sensing the burgeoning and explosion occurring in cardiac surgery at the time, or perhaps just dreaming about goals and achievements as leaders are prone to do, the CRC was incorporated as a non-profit organization on November 30, 1954, by Doctors N.K. Jensen, Reuben Berman, and Lyle J. Hay and a group of Minnesota citizens representing medicine, business, industry, engineering, finance, and hospital administration. Preceding this culmination was a circumstantial Sunday morning meeting between Doctor N. K. Jensen and Jay C. Phillips leading to preliminary discussion with then Dean Harold S. Diehl and Owen Wangensteen, Professor, and chairman of the department of surgery at the University of Minnesota.

The principal objectives of the CRC at the time were: (1) the promotion of cardiovascular research, and (2) the teaching, education and training of medical and paramedical personnel.

The fruition of these goals, or course, meant wide-spread improvement in many aspects of patient care, including laboratories, clinical diagnosis, x-ray departments, nursing, monitoring, and intensive care. In retrospect and prospect of it, it is interesting to ponder upon the scope and influence these men have had and will have upon medical care in our Twin City and midwest populations.

One of the fundamental concepts of the CRC was to unite medical and engineering skills in research. Early experiences in this regard were made with Minneapolis Honeywell and Continental Machines, Incorporated. An engineering council was formed.

ENGINEERING COUNCIL

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of Engineering
Continental Machines, Inc.
Willis H. Gille
Chief Staff Engineer
Minneapolis Honeywell

A medical council was formed embracing all of the existing hospitals in Minneapolis at the time.

MEDICAL COUNCIL

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Harold E. Miller, M.D.	Northwestern Hospital
A. Cabot Wohlrabe, M.D.	Swedish Hospital
Richard C. Gaard, M.D.	Fairview Hospital
Andrew W. Shea, M.D.	St. Mary's Hospital
Jacob H. Strickler, M.D.	St. Barnabas Hospital
Richard L. Varco, M.D.	University of Minnesota Hospital
S. R. Maxeiner, Jr., M.D.	Asbury Hospital
Claude R. Hitchcock, M.D.	Minneapolis General Hospital
Tague C. Chisholm, M.D.	Abbott Hospital
William D. Nessit, M.D.	Deaconess Hospital
Herbert Wells, M.D.	Minneapolis Veterans Hospital

*Presented at the Special Meeting of the Twin City Thoracic and Cardiovascular Surgical Society. December 5, 1977, Minneapolis, Minnesota.

†Minneapolis thoracic surgeon.

And of course then, as now nothing seems to work for long, at least, without money, and a fiscal council was formed.

Fiscal Council
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The Jay C. Phillips Research Laboratory at Mount Siani Hospital fortuitously was completed in the latter part of 1954 at a cost of $125,000.00 providing an outstanding facility for laboratory work. Animal research was started in January of 1955 in the fields of experimental coronary artery occlusion, myocardial revascularization, aortic valve repairs and substitution, pump oxygenators, heat exchangers, prosthetics, cardiopulmonary bypass, hypothermia, mechanical assist of the failing heart, automatic anesthetic machines, coronary arteriography, blood fat studies, transaminase studies, and transfusion reactions.

To local funds, additional financial support for these studies was obtained through grants from the National Institute of Health, The American Heart Association, and the Minnesota Heart Association.

A by-product of the CRC was the establishment of the Rappaport Professorship of surgery. James Rappaport died of coronary heart disease. Max Rappaport, a brother of James, and a patient of Doctor Reuben Berman proposed a living monument to his brother. Matt Levitt and Sam Maslon structured the Rappaport Professorship of Surgery with the University of Minnesota and the author humbly submits that he was the first appointee to this position in 1956.

Although literally in the jaws of the lion, with surgical giants at the University of Minnesota (Lillehei, Lewis, and Varco) and at the Mayo Clinic (Kirklin, Ellis, and McGoon), two of the world's leading centers in heart surgery at that time, open heart surgery with cardiopulmonary bypass was started at Mount Siani Hospital on July 6, 1956. In many respects the proximity of these leading centers served as catalysts to the development and growth of cardiac surgery in our community.

On November 18, 1958, open heart surgery was started at Northwestern Hospital, now Abbott-Northwestern Hospital, and on July 6, 1960 at St. Mary's Hospital. Within the next decade, open heart surgical programs were established at St. Barnabas, Swedish, now Metropolitan Medical Center, North Memorial, and Fairview Hospitals.

On April 6, 1959, Doctors Reuben Berman and Lyle J. Hay, officially resigned their positions in the CRC and the stewardship of the organization was primarily in the hands of N. K. Jensen who served as president for the next 10 years, following which time the author (JJG) assumed this office. Doctor N. K. Jensen then served on the board of directors. In 1969, Donald C. Wright, accountant and Robert P. Larson, attorney and son-in-law of N. K. Jensen, assumed the comptrollership of the CRC. This function was then delegated to St. Mary's Hospital in 1971 and is now supervised by Maurice Mahli of that institution. Robert P. Larson became the legal counselor of the CRC in 1970.

The officers of the CRC 1977 are as follows: President — Joseph J. Garamella, Vice President — Scott Anderson, Secretary, Treasurer — Robert P. Larson, Comptroller — Maurice Mahli.

The board of directors CRC 1977: Joseph J. Garamella, M.D., N. K. Jensen, M.D., Scott Anderson, Robert Spinner, Marvin Ervasti, Michael F. Lynch, M.D., Paul Gannon, M.D., and Robert P. Larson.

For a period of time the research laboratory at St. Joseph's Hospital in St. Paul was used with the help of the legendary Sister Victorine. Later a research laboratory was established in the abandoned kitchen at St. Mary's Hospital and now a laboratory at Unity Hospital is in use under the direction and supervision of Doctor Paul Gannon.

In the middle of the 1960s, two factors changed the polarity of the CRC. First, funds available for basic research were rapidly dwindling. Secondly, the rapid growth of open heart surgery in our community hospitals required a greater number of trained extracorporeal perfusionists. Through the combined efforts primarily of Scott V. Anderson, Vice President of North Memorial Medical Center, Doctor N. K. Jensen, and Donovan Peterson, supervisor of the technicians of CRC, negotiations were conducted with North Hennepin College of Minneapolis. A two year curriculum for training of extra-corporeal perfusionists was established between North Hennepin College and CRC, this being finalized in July of 1972 by the state board of higher education.

From 1972 to 1977, 27 students have graduated

from this course. Twenty-one of these have been placed in clinical extra-corporeal perfusion. Of the 21 placements, six have been with CRC, six have been with other groups in the city, and nine have been placed out of state. (Tulsa, Oklahoma; Philadelphia, Pennsylvania; Iowa City and Davenport, Iowa; Toronto, Canada; Fort Lauderdale, Florida, and Madison, Wisconsin).

At the present time CRC through its extra-corporeal perfusionists provides services at the following hospitals; St. Mary's Hospital, Abbott-Northwestern Hospital, North Memorial Hospital, Fairview Hospital, Metropolitan Medical Center, Fairview Southdale Hospital.

Cases of cardiopulmonary bypass and the use of the intra-aortic balloon for the past three years are tabulated.

Activity Report

HEART — LUNG BYPASS

Jan — Dec 1975 — 321 Cases
Jan — Dec 1976 — 366 Cases
Jan — Nov 1977 — 332 Cases

Intra-Aortic Balloon Pump

Jan — Dec 1975
76 patients, 258 patient days
Jan — Dec 1976
66 patients, 203 patient days
Jan — Dec 1977
37 patients, 130 patient days

After twenty-three years, the CRC stands organized and solvent. The opportunities for continued community service remain. We are all indebted to the founding fathers of this organization and in particular to Doctor Nathan Kenneth Jensen for his unceasing and tireless efforts, oftentimes occult, for his vision and perseverance and for the strength of his devotion to service.

Cover Photograph

"Airborne Milkweed"
Donald A. Scholz M.D.

Dr. Donald A. Scholz has been collecting and photographing butterflies and their nocturnal brother, the moth, for almost as long as he has been in Rochester. A physician in Endocrinology and Internal Medicine, Dr. Scholz joined the Mayo Clinic staff 24 years ago.

While butterflies are a favorite subject, Dr. Scholz also records sunsets, landscapes and a variety of plants and animals. His photographs have won several awards for superior nature photography including the Newspaper National Snapshot Award winner in 1963, the front cover of the Minnesota Medicine Journal in 1969 and the Internal Medicine News Monthly award. He usually works in color using a Nikon F camera.

The cover photograph was taken in an open woodlot back of Dr. Scholz's home in Rochester.

"Selectivity is important in getting a good photograph" says Dr. Scholz. "I match or complement the color of the insect with the flower or twig it is on. The way the subject fills the frame is also important." While Dr. Scholz's photographs are precise renderings of nature, the pattern arrangement and selectivity of subject and view reveal the artist's eye.

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One hour of Category I credit of the Physician's Recognition Award of the AMA.

September 12	Systemic Lupus Erythematosus	Dr. Alfred J. Fish, University of MN
September 19	Problems of the Neonate	Professor P. Monnet Lyon, France
September 26	The Name of the Game	David J. Merrell, Ph.D. University of MN
Mental Health Rounds		
September 21	Aspects of Residential Treatment for Child with Case Presentation	Presentors: Tom Carter, M.D. Charles Cutler, Ph.D. Abbott-Northwestern

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Editorials

N. K. Jensen (1910-1978)

Pioneer Thoracic and Cardiovascular Surgeon

"To accomplish great things we must not only act, but also dream; not only plan, but also believe."

Anatole France

On May 15, Nathan Kenneth Jensen died from the complications of refractory hypertension. He is survived by his wife, Marian, and his four children, Mary, Nils, Bobby and Christine. He is also survived by a large number of grateful surgeons for whom he was also a father. We shall all miss him because he had the power to enrich the lives of those around him as only a few gifted humans are able to do.

People amazed him. He was amazed at how they converted the desert of the Snake River plains in southern Idaho into rich farm land through irrigation. His father, Nils, directed this, the largest project in the West. He was amazed at the stories of the prospectors encountered in his climbs up the Sawtooth Mountains north of Rupert. This wonder of youth at life in its infinite variations never left him, emerging unscathed after tragedy or triumph.

His greatest pleasure was in sharing his knowledge. He was enthused about what he had to tell at the dinner table to the family, at the cardiovascular conference or in the operating room. He had a gift for expression. Things came alive as he spoke. You actually saw Stephen Hales pour gallons of water down the trachea of a horse without apparent harm, proving a point as fresh today as it was to Hales' dumbfounded companions two hundred years ago. He knew how the heart and lungs worked together and he tried to explain it to us who were not brought up on collapse therapy for tuberculosis and its consequent respiratory insufficiency and pulmonary hypertension.

He was ingenious. As a child he got a neighbor physician to show him how to make his own bow and arrows. He bent his own skis by prying the boiled tips in a cupboard drawer, the family indulgently and admiringly stepping over them for a few days. Later, on the shore of Medicine Lake, he and the children built their own speed boat. He devised a metal internal splint to support the anterior chest after correction of pectus excavatum. He applied the latest developments in surgery to solving the problems of his patients, as noted by Robert Schmidt elsewhere in this issue.*

He was courageous. When cardiovascular surgery was in its infancy, mostly practiced in university settings, he helped introduce it into the private sector, not without some difficulty. He visited Sones shortly after that investigator had developed coronary angiography at the Cleveland Clinic, learned the technique and brought it back to introduce

*See page 525.

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from papers presented at 82nd Annual Mtg. - A.A.O.O. as reported in Dec./77 "Hearing Instruments"

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as quoted by Lindsey Pratt, M.D.

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Clyde F. Marquardt

it at Northwestern Hospital. He championed Vineberg's internal mammary implantation operation. Later, when Favaloro developed the saphenous vein graft operation for coronary artery disease, he and his associates appreciated its advantages and applied it shortly thereafter. He persisted until the quality of angiography became excellent and the results of revascularization surgery became predictably beneficial in the great majority. He threw himself into the struggle and, convinced of its righteousness, did not count the cost.

He was generous in a field of surgical endeavor not always noted for the humility of its practitioners. He was honest in his self-appraisal. Shortly before his death, he wrote, "I am aware of the fact that we all stand on each other's shoulders and that if I had accomplished anything worthwhile, my long-term colleagues were responsible." On another occasion, he said, "If anyone accomplishes anything really significant in our field, I'm really happy because it can't help but benefit all of us." In commenting on the alleged surplus of talent in cardiovascular and thoracic surgery, he said, "There is more real work out there to be done than there are workers." This was spoken to me as a timorous neophyte hesitating before plunging into solo private practice by one who had seen thoracic surgery almost dry up after streptomycin's introduction and who was making an act of faith in the future of direct surgery on the coronary arteries, then just beginning.

A light has gone out but its memory will endure. Cardiovascular and thoracic surgery has won an accepted and honored position in the community. No one can practice it without in one way or other standing on his shoulders.

Paul G. Gannon, M.D.
Board of Editors
Minneapolis, Minnesota

Nathan K. Jensen, M.D.

The Minnesota Medical Association and its Officers and Trustees are pleased to see this issue of MINNESOTA MEDICINE dedicated to the memory of one of its highly respected members, Dr. Nathan K. Jensen. Dr. Jensen's scientific exhibits at state and national conventions will long be remembered by many who knew him less well than those who admired so deeply his day to day activities. Let this publication/issue stand as a memorial to his life and works.

Robert S. Flom, M.D.
President

John R. Sebald Memorial Hand Symposium

The Second Annual John R. Sebald Memorial Hand Symposium, a seminar for primary care physicians, surgeons, nurses, occupational and physical therapists, will be held Friday, October 13, 1978 in the O'Shaughnessey Education Center at the College of St. Thomas in St. Paul.

The featured speakers are:

Dr. Harold E. Kleinert — Louisville, Kentucky
Dr. Robert W. Beaseley — New York, New York
Dr. Robert D. Beckenbaugh — Rochester, Minnesota
Barbara Johnson, O.T. — Rochester, Minnesota
Arnold Hamel, M.D. — Hennepin County Medical Center

Application has been made for Category I credits, American Medical Association, American Academy of Family Practice and Minnesota Nurses Association continuing education credit.

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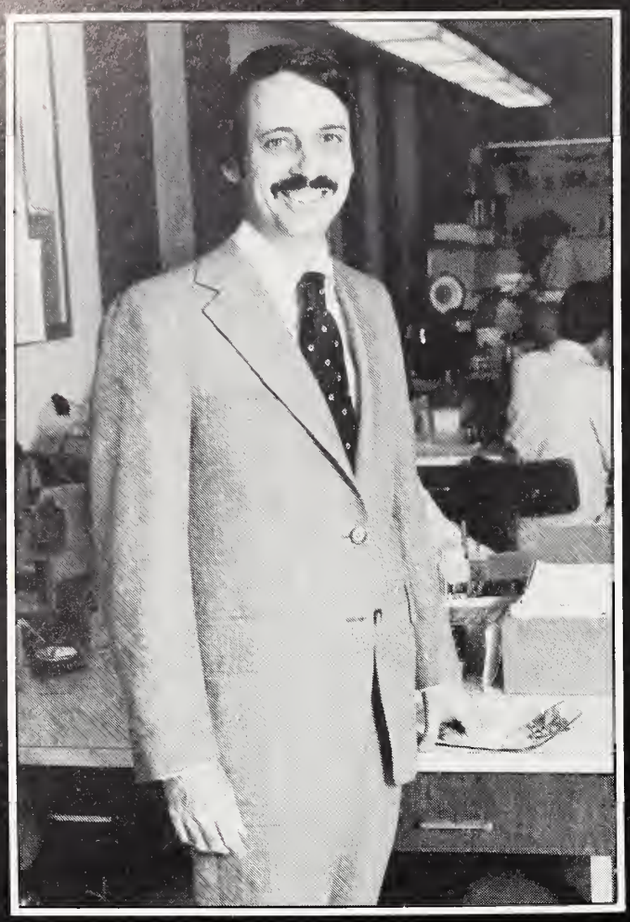
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Minnesota Medical Association

Conversation with the President of the Minnesota Medical Association, Dr. Robert S. Flom

This conversation took place in a conference room on the ninth floor of the American National Bank Building in St. Paul. Why in a bank building? Because the Minnesota Medical Association has its headquarters there. The Association occupies about half of the ninth floor where the Association's 32 employees work. We talked until 6:00 P.M. Doctor Flom had just finished his afternoon office hours after a long morning in the operating room.

Dr. Richard Reece:
Dr. Flom, what is your specialty, and how long have you been in practice?

Dr. Robert Flom:
I'm a general surgeon, and I've been practicing general surgery in a group since July of 1959, in St. Paul.

Dr. Reece:
As the new president of the MMA, could you tell when you first became interested in medical politics, and for what reason?

Dr. Flom:
I became interested in medical organizations, that is, organized medicine, when I first started in surgical practice. I was asked to serve on committees for the county medical society. One thing has evolved into another over the years. I am often called a politician, but I hope that term is used in the constructive sense. I regard politics as a service towards organized medicine.

Dr. Reece: *What do you see as central issues facing the Association during your tenure?*

Dr. Flom:
Most pressing is the cost issue. That's on everyone's lips. Internally, I see the big issue as unification, and getting people to work together and getting every physician involved. You know, there is a great deal of talent out there if we can only release it. If I made any contribution in Ramsey County it was getting people involved. I hope to do that in the state organization as well.

Dr. Reece: *You mean you have plans for a membership drive?*

Dr. Flom:
Yes, of course. But it's more than that, I want people to communicate their concerns and to put their concerns into effective action, primarily through existing organizations or county societies or committees. I hope I will be able to encourage them to understand the importance of what they do and how they can do it more effectively for their group and for themselves.

Dr. Reece:
You played a central role in organizing the Socio-Economic Division of the MMA in 1975. This division now consumes 40 percent of the Association's budget. Has the reorganization been worth the cost? Has it made the Association more potent as a political force?

Dr. Flom:

First of all, when you say 40 percent of the budget, you should know much of that 40 percent preexisted before the reorganization. It was just called something else. Yes, I think the Association has become more effective. It has become more effective in a number of ways, it seems to be better organized. We know where certain issues should go and who should handle them. Action is prompter and more considered. Of course, we are tackling more issues and are expanding our work in health planning and in dealing with health planners. Also we've bolstered the communications department. Health planning and communications are really the two big additions.

Dr. Reece:

The public, the legislature, and the press understand us better, then?

Dr. Flom:

I can't speak for their understanding, but I can speak for our communications with them. Certainly we are doing much better than we were doing a few years ago.

Dr. Reece:

You mean the health planners sometimes even consult with us before they make precipitous decisions?

Dr. Flom:

Yes, a tremendous change has taken place the last two years. I recall vividly going to health planning agencies and coming away angry, frustrated, and insulted. That day is largely gone. This is particularly so in the Metro area. Because of the earlier emphasis on health planning issue, the physicians got organized and made up their own minds early on the issues, and people in planning and regulation have to seek some consultation. They have been doing that, and I must say that one of our principal performers in this area has been Dr. John Coleman, who is head of the Metropolitan Physicians' Health Force and staff. We are certainly much more effective than we were three or four years ago. We are not winning all the battles, but we are being asked our considered judgment on what benefits the health care of Minnesota patients.

Dr. Reece:

As I understand it, Coleman's original concept was to set up parallel committees to those in the health planning agencies, thus you meet specific problems with a specific expertise.

Dr. Flom:

Yes, that is correct. Whenever the Health Board has had task forces set up to accomplish something, we've had a parallel committee and that has made us a reliable source of knowledge.

Dr. Reece:

The most recent development in the State Association has been the MMA Health Care Cost Commission which you serve on and which is composed of members of other sectors of society and physicians. This has been going on now for about a year and a half. Could you comment on it?

Dr. Flom:

The Commission has been busy. We started out meeting every other month, now it's at least twice a month. The Commission usually has committees and task forces meeting in between the large body meeting. We have heard testimony and papers from many people on a variety of subjects that impact on health care cost. We are really now just beginning to hammer out recommendations, none of which have been officially approved. But the various task forces and committees have each started to promulgate

recommendations. I would imagine that within the next two months, we should have most recommendations hammered out. It is still intended that the Commission terminate its work after the prescribed 18 months in November. I presume that the report will take a little time, and it should be available early in 1979. Is the Cost Commission going to continue? We've heard strong suggestions that this sort of function should continue as a follow-through on the recommendations that are made and in dealing with new issues as they arise.

Dr. Reece:

What's the atmosphere of the Cost Commission? You are dealing with divisive subject matter. Sometimes it must generate more heat than light.

Dr. Flom:

In general, discussions have been pretty much to the point. There are many personalities, of course, and a wide range of view points. The discussion has certainly been animated, but our real divisions will show when we finally come down to hammering out the recommendations through the democratic process. I should imagine it will get very democratic.

Dr. Reece:

Maybe it will be like the Supreme Court's Bakke decision. You will have a majority opinion and minority opinion, with conflicts within each opinion.

Dr. Flom:

I expect there will be many minority reports on various issues. That is good.

Dr. Reece:

Fine. As you know, after Proposition 13 in California, talk of tax revolt fills the air. Do you expect the new conservatism to have any effect on either state or local health planning?

Dr. Flom:

Certainly any politician who ignores that message from the California voters is in trouble. In the halls of Congress there is considerable awareness on what a costly endeavor National Health Care would be. I remember so well when Medicare was being debated. They had a meeting over in Minneapolis where people from the government came out and told us the cost of Medicare would be $2,000,000,000 in the first year. The AMA estimated the cost of the first year program would be double that amount. The AMA came out just about right. Maybe some legislators remember that. At any rate, there certainly was a consciousness in the House and the Senate of how much they might expand the system and hence its cost. The California vote put every politician on notice that the populace will tolerate only so much in the way of expenditures.

Dr. Reece:

It's an ironic turn of events. When Medicare and Medicaid were introduced in 1965, most physicians said Medicare was a foot in the door for National Health Care. Because of Medicare's expense, it may be the force that indefinitely delays a National Health Bill rather than ushering it in. Now perhaps, I could ask you a series of questions based on a recent editorial in the Wall Street Journal *by Peter Drucker. Drucker is a leading social critic, who speculates on the shape of future health care in the U.S. I'd like to try out his predictions on you, to see if you agree with him.*

He says, number one, that no grass roots movement towards the National Health Care bills exists in the U.S. because 90 percent of the American people are well satisfied with the present system. Do you agree with that assessment?

Dr. Flom:

Yes, I would agree with it. However, I would not ever underestimate the zeal of the 10 percent who are the shakers and movers in social issues. You know, the articulate minority often shapes the agenda. In surveys the last ten years, about 85-87 percent of the people interviewed are either extremely well satisfied or well satisfied with the existing system. Any politician would regard that sort of a majority as a landslide or a mandate for whatever he had stood for, and yet, with these factors or figures coming back time and time again, ti seems strange that 10-15 percent continue to generate an aura of crisis in health care.

Dr. Reece:

Don't you think the "crisis" is ebbing?

Dr. Flom:

Well, a crisis in the minds of those who perceive it, and perhaps that is what is ebbing. We are coming to realize that despite the health care costs, the benefits have been large. In general, people are getting a good buy for their health dollar, particularly when you view what is demanded by the American people in health care and other issues.

Dr. Reece: *Demand shapes the system?*

Dr. Flom: Yes it does.

Dr. Reece:

Drucker also predicts that within 10 years, in a step-wise fashion, 95 percent of the American people will be covered by catastrophic illness insurance. Do you think that this is a more likely development than a sudden National Health Plan?

Dr. Flom:

Yes, I would think so. Minnesota has already enacted a law that covers catastrophic illness. Organized medicine has always, so far as I am aware, favored some sort of catastrophic insurance. In fact, the insurance we have today started in the 30s and 40s as a protection from catastrophe. As it has evolved through various bargaining mechanisms and other social changes, it has become the payment mechanism. Many people are fully aware of this now and are anxious to take a step back by not having first dollar coverage. Co-payment would cut down on costs largely by diminishing demand. But co-payment of course, is something that does not have wide appeal and may not be accomplishable at this time.

Dr. Reece:

Do members of the Cost Commission see co-payment as politically "feasible"?

Dr. Flom:

It certainly would not be something that would be easily salable. It might be salable to the Cost Commission, but the Cost Commission might recognize that the general populace would not accept it well. Witness the recent labor strikes, where co-payment has been a large issue, particularly in the coal mining strike.

Dr. Reece:

Drucker says something else that is controversial and goes against the traditional wisdom of the government. The government, particularly Secretary of HEW Califano, has said that all we need to do is push HMOs, and they will be the wave of the future. In fact, HEW is now launching a Madison Avenue campaign to sell HMOs. Yet Drucker feels that because the U.S. is such a sprawling and decentralized country that HMOs are not practical particularly in rural regions. Instead, Drucker says group practice, as we have it today, or in the form of independent practice associations, that is, doctors practicing out of their offices, are much more likely than HMOs. Do you agree with Califano or with Drucker?

Dr. Flom:

Well, I take a middle road. I think that HMOs or prepaid plans will become more evident in this country over the next few years. I think probably that the independent practice associations may well become much more prominent that they are now. It is entirely possible that in many instances they may supplant other prepaid plans commonly known as HMOs. Private practice will survive in this country. Perhaps there will be dislocations or relocations, but we will indeed have a pluralistic health care system which the AMA has long been on record as favoring.

Dr. Reece:

Many of the leaders of the HMO movement themselves prefer a pluralistic environment. They like a competitive atmosphere. So perhaps no group will become dominant or perhaps it will be a geographic phenomenon with the HMOs principally in the large cities.

One of the criticisms of the American system is that it has been uncontrolled and has risen much faster than other countries. According to Drucker, the cost of health care in the U.S. is modest, indeed is much lower than in Germany, Britain, and Sweden. He feels that the health care inflation here is not out of control and that the private sector can make corrective adjustments to bring it under control. Do you agree?

Dr. Flom:

Yes, I do. As a matter of fact, many of the things that our cost commission and the government talk about already are being done.

Many things are raising price consciousness among physicians and hospitals. The voluntary effort of the American Hospital Association and the AMA seems already to have accomplished some slowing of the acceleration of rates. We are always uncertain about inflation because there is no one definite way that the economy is measured. For example, take health care costs as a percent of GNP. The percentage of GNP depends on how well the economy is doing. If medical costs are accelerating faster than the GNP, maybe it is partly our fault and maybe partly the fault of the economy. Or, take cost containment. When we start talking about the total expenditures for hospitals in the CAP program, we are talking about percentage of expenditures per year as compared to last year. As utilization goes down and that goes down because of increasing sophistication of medical care and not just because of PSROs and other factors. Expenditures go down. But as these things occur, hospital day rates go up. Immediately we are crucified by our detractors. Somewhere we've got to find a measure for knowing what the expenditures are in relation to the rest of the economy and have a standard that we can measure against. We need to have the same comparison every year.

Dr. Reece:

So you are saying that the percent of GNP is a crude measurement and doesn't accurately reflect the change in the health system.

Dr. Flom:

Yes, indeed. The measurements are a little hard to interpret. You must remember health care expenditure also includes the expenditures of all of the government agencies. It isn't as though the private sector accounts for all of the increased percent of GNP. A large portion of it goes to regulatory bodies and an even larger portion goes to conform with the regulations that have been promulgated.

Dr. Reece:

I agree. It would be fascinating to change the cost of health care regulation as a percent of the cost of a hospital day for the last 10 years. Dr. Flom, as a consequence of this increased staff in the MMA, I understand that you have been able to have personal meetings with political and public health officials in the state. Is that true?

Dr. Flom:

Yes, that is true. I have talked already about the planning effort and how staff and committees have been able to meet with the HSAs. But in addition, the leadership of the MMA has recently had a number of meetings with state officials on a face-to-face basis, including the governor and some of the commissioners of departments. We have in general been received courteously; these meetings benefit us, as well as the officials, and it seems to me that we have opened a whole new area of communication. This opportunity has always been there. But our new staff and the new organization have made this opportunity a reality.

Dr. Reece:

Would these meetings likely have occurred five years ago? Or would you have thought of having them?

Dr. Flom:

They were less common and I really can't say whether or not they could have occurred. I am sure that some did that I was not privy to.

Dr. Reece:

But there is more of a receptivity to talking out the problems with political leaders on a personal basis now.

Dr. Flom:

Yes, we are better received than we were five years ago, mostly, I'm sure, because our reorganization has made us better informed, better prepared, and more politically astute.

Continuing Medical Education

Minnesota Radiological Society,

Fall Meeting of the Minnesota Radiological Society will be held September 15-17, at Cragun's Resort on Pine Beach at Gull Lake near Brainerd. Contact: John B. Marta, M.D., 125 West College Avenue, St. Paul, 298-8581.

University of Minnesota, Department of Obstetrics and Gynecology

Annual Autumn Seminar on Obstetrics and Gynecology on October 25-27 at the IDS Center Conference Theatre in Downtown Minneapolis. Meets the criteria for credit hours (estimated 17) in Category 1 of the Physician's Recognition Award of the AMA. Contact: Dr. Leon Adcock, University of Minnesota.

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	October 30		

For further information, please contact Carolé Mensing, R.N., Health Professional Coordinator, Diabetes Education Center, 4959 Excelsior Boulevard, Minneapolis, Minnesota 55416. Phone: (612) 920-6742.



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Minnesota Medical Association Criteria

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Concept and Criteria

RONALD E. CRANFORD, M.D.*

In December, 1975, the Executive Committee of the Board of Trustees of the Minnesota Medical Association received an inquiry regarding that organization's policy on the determination of death, withdrawal of extraordinary means of support, and related issues. The inquiry noted that effects of the lower court's decision in the Quinlan case were being felt in Minnesota and made reference to a brain death case then pending in the Hennepin County District Court, concerning the legality of the pronouncement of brain death and termination of life support systems. At the same time, another case of brain death at a north Minneapolis suburban hospital had created concern among medical staff and hospital administrators regarding potential criminal and civil liability.

Because of these factors, the Executive Committee felt there was a need for a special committee to study these issues in depth and to develop guidelines and make appropriate recommendations to the Minnesota Medical Association. Dr. Richard Frey, Chairman of the Board of Trustees, was given the authority to select members of this Ad Hoc Committee on Death.†

After extensive discussion, the Ad Hoc Committee recommended to the MMA Board of Trustees that the Medical Association strongly support a position urging passage of definitive brain death legislation. The committee formulated a brain death bill, modeled from the Capron and Kass proposal[1] which had already been adopted in several states, and urged that this model bill be introduced for legislative action.

These recommendations, including the proposed statutory version, were accepted by the Board of Trustees on April 24, 1976 and later adopted by the House of Delegates on May 21, 1976.

The model statutory legislation, recommended by the Ad Hoc Committee and slightly amended before being approved by the House of Delegates, reads:

> A person shall be pronounced dead if, in the opinion of a physician, based on current standards of medical practice, that person has experienced an irreversible cessation of spontaneous respiratory and circulatory function. In the event that artificial means of support preclude the determination that these functions have ceased, that person shall be pronounced dead if, in the opinion of a physician, based on current standards of medical practice, that person has suffered irreversible cessation of clinically determined total brain function.

After consultation with members of the Minnesota legislature, a brain death bill was introduced for hearings before the Senate Judiciary Committee on February 28, 1977. Members of the legislature who were willing to sponsor this bill and representatives from the Medical Association agreed upon the introduction of a revised, shorter bill containing only a standard of brain death. The bill introduced for hearings, S.F. No. 253, reads:

> A bill for an act relating to public health; providing a definition of death.
>
> BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF MINNESOTA:
>
> Section 1. A person is legally dead if there is irreversible cessation of the function of the entire brain. Nothing in this section shall be construed to prohibit the use of other criteria for determining death.

This bill encountered opposition from certain special interest groups, and the sponsors elected not to pursue further legislative hearings during 1977. It was also decided not to hold hearings during 1978 because of the short legislative session. Currently, plans are being made to support a bill during the 1979 session.

After addressing the issue of legalization of brain death, the Ad Hoc Committee turned its attention to the question of specific medical criteria. From its earliest deliberations, the committee had recognized the critical distinction between the *concept* of brain death and the specific medical *criteria* for the determination of brain death. Legislative efforts should be directed towards the legalization of the concept (i.e. "irreversible cessation of clinically determined total brain function"). Legislation would legally sanction the determination that the death of the brain signifies the death of the person. The medical criteria, however, should not be the subject of legislative or judicial

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†Committee members selected: Ronald Cranford, Minneapolis (chairman); Henry Broker, St. Cloud; John Burns, St. Paul; Thomas Byrne, Minneapolis, Medical Student; Shelley Chou, Minneapolis; John Eustermann, Mankato; John Fangman, Minneapolis; William Karnes, Rochester; Fred Mecklenburg, Minneapolis; and Robert Powers, St. Paul. Dr. Powers resigned in 1977 and was replaced by Terrance Capistrant, St. Paul.

action and certainly should not be incorporated into statutory legislation, but should reflect the prevailing standards of medical practice in the state of Minnesota. The development of medical criteria would further serve to illustrate the distinction between the concept and the criteria.

Specific medical criteria and procedural guidelines, formulated by the Ad Hoc Committee on Death, were adopted as official policy of the MMA by the House of Delegates on November 20, 1976. Since that time, these criteria have been the subject of many presentations at hospitals and medical meetings in Minnesota and have been well received by the medical community.

The main purposes of the Minnesota criteria are: (1) to provide the medical community with a current standard of medical practice; (2) to educate the medical profession by clarifying issues surrounding the brain death concept: and (3) to help educate and inform the public so that they would be aware of the accepted standards used by the medical community. With respect to the latter two objectives, these criteria are a significant step towards attempting to meaningfully delineate between separate, although related, issues, such as the pronouncement of death from allowing to die; total brain death from lesser degrees of brain damage, such as the persistent vegetative state; and the difference between the concept and the criteria.

Criteria for the Determination of Brain Death
Minnesota Medical Association*

The following current criteria for the determination of brain death are recommendations of the Ad Hoc Committee on Death of the Minnesota Medical Association and are intended to provide consistency and guidance in the pronouncement of brain death by physicians throughout the state of Minnesota. The final responsibility regarding pronouncement of death and termination of treatment and support rests with the attending physician; nevertheless, in the opinion of the Ad Hoc Committee, the criteria listed below (items 1-5) are the necessary and essential criteria that should be satisfied in all cases of brain death. These essential criteria conform to the concept of brain death, that is, irreversible cessation of total brain function determined by clinical examination; if these criteria are satisfied, the physician can be assured that there is a permanent, nonfunctioning brain without any reasonable chance of survival or resumption of brain functioning.

*These criteria were adopted by the Minnesota Medical Association House of Delegates in November, 1976.

1. Cerebral Unresponsivity

   Deep coma with total unawareness and unresponsiveness is present. Intense stimulation evokes no verbal or motor responses. No spontaneous movements nor involuntary posturing (except purely spinal segmental responses) are present.

2. Apnea

   The patient is observed for spontaneous respiratory movements for a minimum of three minutes without respirator support.

3. Absent Brain Stem Reflexes

   Pupils are fixed and mid-position (greater than 5.0 mm. in diameter). All brain stem reflexes are absent, including oculocephalic, oculovestibular, corneal, gag, cough, swallowing, decorticate or decerebrate posturing.

   Spinal segmental reflexes, such as deep tendon reflexes and triple flexion responses, may be present, since these are only indicative of a viable spinal cord and are not incompatible with irreversible cessation of brain function.

4. Period of Observation — 12 Hours

   There should be at least two separate clinical examinations of the patient with a minimum of 12 hours between the first and second examination.

5. Irreversibility

   Any reasonable possibility of a reversible CNS dysfunction should be excluded, specifically, hypothermia (temperature below 90 degrees F, 32.2 degrees C) or intoxications.

6. Confirmatory Tests

   Confirmatory tests, such as EEG and cerebral angiography, may provide supportive data in the diagnosis of brain death, but are not essential. When the etiology of the cerebral insult is known and there is a gross structural lesion of the brain, the clinical findings of cerebral unresponsivity, apnea, and absent brain stem reflexes, establish that brain death is present. When the etiology is known but there is no gross structural lesion of the brain or when the etiology is unknown (provided intoxications and hypothermia have been excluded), electrocerebral silence, according to the standards of the American EEG Society, is of confirmatory value and provides objective documentation. Cerebral angiography and other techniques to demonstrate absence of cerebral blood flow may also be of confirmatory value in selected cases. The decision to use the EEG and/or other confirmatory tests should be made by the attending physician.

Procedural Guidelines

Once the determination has been made by the attending physician that the patient has satisfied the medical criteria for brain death, the following procedural guidelines are recommended.

The physician is legally obligated, by proposed statutory legislation, to pronounce the patient dead once the medical criteria have been satisfied. Consent of the family is not legally required; however, the family should be kept informed of the condition and prognosis of the patient and of pertinent facts relating to brain death so that the family can fully understand what is being done.

The patient is pronounced dead, and then the respirator is discontinued. The reason the respirator is discontinued is not because it has been considered an extraordinary means of support, but because the patient is now medically and legally dead.

Consideration of transplantation should have no influence on the criteria for brain death nor the time of death. The criteria remain the same in all cases, whether or not transplantation is contemplated. The determination and pronouncement of brain death should be made by physicians who are not involved in the transplantation.

Although the patient is not pronounced dead until all criteria, including the period of observation to verify irreversibility, have been satisfied, the time of death occurred when the irreversible cessation of brain function was first noted.

There should be adequate documentation in the medical records to substantiate that the criteria for brain death were fulfilled and that the patient was pronounced brain dead. All other pertinent issues and facts relating to the case should be documented in the medical records.

From the medical, moral, and legal standpoint it is absolutely essential to separate the issues of when a person should be pronounced dead from when a person should be allowed to die. These recommendations are not intended to provide any operational guidelines to decide when extraordinary means of support should be discontinued in a patient who, although severely and irreversibly brain damaged, fails to satisfy all the criteria for irreversible cessation of functioning of the brain.

In the process of formulating these criteria, the Ad Hoc Committee has acknowledged an obligation to revise and update the criteria whenever appropriate, consistent with further advances in medical technology. These criteria are also meant to serve as a basis for an ongoing dialogue on brain death and related issues. The Ad Hoc Committee on Death and the Minnesota Medical Association welcome comments regarding any aspects of these criteria and guidelines. A separate article in next month's MINNESOTA MEDICINE will discuss these criteria in greater detail.

Reference

1. Capron AM, Kass LR: A statutory definition of the standards for determining human death: An appraisal and a proposal. U Penn L Rev 121:87, 1972.

Continuing Medical Education

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–Cole, D.R., et al.: Antimicrob. Ag. Chemother. 11(6):1033-1035 (June) 1977.

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Biliary tract infections due to Escherichia coli, various strains of streptococci, Proteus mirabilis, Klebsiella species and Staphylococcus aureus.

Bone and joint infections due to Staphylococcus aureus.

Genital infections (i.e., prostatitis, epididymitis) due to Escherichia coli, Proteus mirabilis, Klebsiella species, and some strains of enterococci.

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Indications: Although the principal indication for cloxacillin sodium is in the treatment of infections due to penicillinase-producing staphylococci, it may be used to initiate therapy in such patients in whom a staphylococcal infection is suspected. (See Important Note below.)

Bacteriologic studies to determine the causative organisms and their sensitivity to cloxacillin sodium should be performed.

Important Note: When it is judged necessary that treatment be initiated before definitive culture and sensitivity results are known, the choice of cloxacillin sodium should take into consideration the fact that it has been shown to be effective only in the treatment of infections caused by pneumococci, Group A beta-hemolytic streptococci, and penicillin G-resistant and penicillin G-sensitive staphylococci. If the bacteriology report later indicates the infection is due to an organism other than a penicillin G-resistant staphylococcus sensitive to cloxacillin sodium, the physician is advised to continue therapy with a drug other than cloxacillin sodium or any other penicillinase-resistant semi-synthetic penicillin.

Recent studies have reported that the percentage of staphylococcal isolates resistant to penicillin G outside the hospital is increasing, approximating the high percentage of resistant staphylococcal isolates found in the hospital. For this reason, it is recommended that a penicillinase-resistant penicillin be used as initial therapy for any suspected staphylococcal infection until culture and sensitivity results are known.

Cloxacillin sodium is a compound that acts through a mechanism similar to that of methicillin against penicillin G-resistant staphylococci. Strains of staphylococci resistant to methicillin have existed in nature and it is known that the number of these strains reported has been increasing. Such strains of staphylococci have been capable of producing serious disease, in some instances resulting in fatality. Because of this, there is concern that widespread use of the penicillinase-resistant penicillins may result in the appearance of an increasing number of staphylococcal strains which are resistant to these penicillins.

Methicillin-resistant strains are almost always resistant to all other penicillinase-resistant penicillins (cross-resistance with cephalosporin derivatives also occurs frequently). Resistance to any penicillinase-resistant penicillin should be interpreted as evidence of clinical resistance to all, in spite of the fact that minor variations in *in vitro* sensitivity may be encountered when more than one penicillinase-resistant penicillin is tested against the same strain of staphylococcus.

Contraindications: A history of a previous hypersensitivity reaction to any of the penicillins is a contraindication.

Warning: Serious and occasionally fatal hypersensitivity (anaphylactoid) reactions have been reported in patients on penicillin therapy. Although anaphylaxis is more frequent following parenteral therapy it has occurred in patients on oral penicillins. These reactions are more apt to occur in individuals with a history of sensitivity to multiple allergens.

There have been well documented reports of individuals with a history of penicillin hypersensitivity reactions who have experienced severe hypersensitivity reactions when treated with a cephalosporin. Before therapy with a penicillin, careful inquiry should be made concerning previous hypersensitivity reactions to penicillins, cephalosporins, and other allergens. If an allergic reaction occurs, the drug should be discontinued and the patient treated with the usual agents, e.g., pressor amines, antihistamines, and corticosteroids.

Safety for use in pregnancy has not been established.

Precautions: The possibility of the occurrence of superinfections with mycotic organisms or other pathogens should be kept in mind when using this compound, as with other antibiotics. If superinfection occurs during therapy, appropriate measures should be taken.

As with any potent drug, periodic assessment of organ system function, including renal, hepatic, and hematopoietic, should be made during long-term therapy.

Adverse Reactions: Gastrointestinal disturbances, such as nausea, epigastric discomfort, flatulence, and loose stools, have been noted by some patients. Mildly elevated SGOT levels (less than 100 units) have been reported in a few patients for whom pretherapeutic determinations were not made. Skin rashes and allergic symptoms, including wheezing and sneezing, have occasionally been encountered. Eosinophilia, with or without overt allergic manifestations, has been noted in some patients during therapy.

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(Continued to Page 570)

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President's Letter

A Strong and Unified Voice

Election 1978 has aroused considerable interest in this country and seems to signal a reawakening of those who have sat idly by and experienced silent frustration watching their government gradually control more and more of their lives. Much of the frustration stems from the sense of helplessness and a feeling of insignificance of individual effort in attempts to influence the direction of society as a whole. Organized medicine has altered the course of some legislation, but not entirely to its satisfaction.

Prior to 1940 the main significant legislation affecting medicine consisted of the Medical Practice Act on the state level and the Harrison Act controlling the production and distribution of narcotics on the federal level. But in the forties the Hill-Burton Act designed to extend better medical care facilities primarily to fill a perceived need in rural areas was enacted. It marked the onset of placing certain strings upon acceptance of federal assistance, such as prescribing a certain percentage of charity beds in a facility constructed. The interpretation and implementation of this law included a bed/population ratio considerably higher than the ratio now accepted, which resulted in a considerable portion of our over bedding problem today.

The 1950s heralded the proliferation of biologically active substances including a plethora of antimicrobials which altered the pattern of disease, and that enormously sociologically effective medication which became known as "the pill" and the explosion of psychotropic substances which have proved to have considerable social as well as medical consequences. All of this in a world having trouble adjusting to the age of nuclear fission and Sputnik's announcing the space age and stimulating an acceleration of scientific education in a startled America.

The 1960s produced social unrest as individual rights became important and an unpopular war grew larger. The U.S. Senate quietly ratified the Medicare — Medicaid law almost as a memorial to an assassinated President who had been frustrated by this same Senate's refusal of the same proposal. Thus began the federal government's direct involvement in some individuals' care and removed a large portion of local and county governments' involvement.

The early 1970s produced a State Certificate of Need Law which was given to planning bodies as an enforcing weapon for plans developed. Then came the PSRO Law which was intended to insure that federal dollars bought appropriate values. It paid lip service to quality as well as economy but failed to prioritize and has thus resulted in schizophrenic interpretation. Then in 1975 the National Health Planning and Resource Development Act was signed into law. Congress, perhaps weary and wary of administrative bureaus' history of rewriting enacted laws by interpretation of intent and by regulation, wrote his law in language reputed to be the most specifically directive of any law previously written. It sets in place the administrative mechanism needed to run and control a National Health Insurance System. The financing of such a system remains a question and has so far deterred the final step in a country already plaqued by overspending and inflation while inhibiting through regulation the development of

its supporting economy.

This brief history of some of the events of recent decades is intended to persuade physicians that scientific and professional accomplishments are indeed less meaningful if the political and legislative actions cannot be simultaneously influenced. The immediate focus is on the campaign and the ballot box but the ongoing concern must be for medicine to speak with a strong and unified voice through MMA and AMA, for voices in the wilderness are rarely heard, easily ignored, and too easily muted.

Robert S. Flom

Robert S. Flom, M.D.
President
Minnesota Medical Association

Continuing Medical Education

University of Minnesota, Department of Obstetrics and Gynecology

Annual Autumn Seminar on Obstetrics and Gynecology on October 25-27 at the IDS Center Conference Theatre in Downtown Minneapolis. Meets the criteria for credit hours (estimated 17) in Category 1 of the Physician's Recognition Award of the AMA. Contact: Dr. Leon Adcock, University of Minnesota.

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October 30	November 27	December 18

For further information, please contact Carolé Mensing, R.N., Health Professional Coordinator, Diabetes Education Center, 4959 Excelsior Boulevard, Minneapolis, Minnesota 55416. Phone: (612) 920-6742.

Hair

JOHN T. PEWTERS, M.D.

ALOPECIA AREATA, usually rounded discrete spots of scalp hair loss, is common.

Alopecia (capitus) totalis, loss of all scalp hair, is less common.

Alopecia universalis, complete loss of all hair over the body (scalp, eyebrows, eyelashes, nasal hair, cilia, axillary, pubic and even toe and fingernail involvement and loss) is least common.

Case History

Male, age 64 years. December 1975 the patient began to develop small spots of areata. At ten years of age, patient had two spots of areata. The family physician took a book off the shelf and prescribed a white liquid to paint on the spots. The patient suspects it was full strength white iodine. An R.N., turned beautician, predicted return of hair. Also she told the patient he would never have a bald problem because he had a loose scalp. She was one-half right. Hair returned in one year, but at age 64 years, loose scalp or not, *all* hair evaporated.

Complete physical examination, including many tests and procedures was done.

Patient was told "disease" is not caused by stress or nerves[1]. Most probably immunologic causes are a factor. None have been uncovered as yet. Many of the tests have been repeated over a two year period. Patient is now getting the "false" growth on scalp and beard areas. No regrowth of hair on body, eyelashes, nasal area or eyebrows as yet. Toe and fingernail inflammation has subsided.

Complete loss of hair is no joke[2]. Perspiration, salty, runs into the eyes. Foreign matter finds its way to the eyes. Secretions from the nose drip out unexpectedly. Toe and fingernail involvement is a painful problem. Brittle, thin, red, painful nail changes are easily seen. (Ten percent of alopecia universalis.)

Psychiatric depressive symptoms play a major role in each type of alopecia, but in universalis, depression is a serious factor.

See editorial, page 585.

Suggested outline for examination:

Complete history and physical examination.

Complete blood count, urine, sedimentation rate, thryoid tests; TSH, T7, T4, T3.

Immunological Profile

1. IgA
2. IgM
3. IgE
4. IgD
5. IgG
6. Etc.

Serum electrophoresis.

Tests for T and B cells.

Complement and antinuclear antibody tests.

Biopsy of scalp (or a hair area).

Fluorescent stains.

Serology

Xray of chest, electrocardiogram, x-ray studies of stomach, colon, and gallbladder.

Hormonal studies.

Reasons why the preceding tests should be done:

History, physical, blood counts, urine, sedimentation rate; Xray of chest, stomach, colon and gallbladder; stool, etc. are helpful in hereditary alopecia, intrinsic





causes[4] with skin manifestations that could include hair loss and the various clues a careful history always reveals.

Thyroid testing, especially thyroid stimulating hormone (TSH) are valuable.

Immunological Profile:[5]

1. IgA This is important in the defense against mucous membrane infection of respiratory, gastrointestinal and urinary tracts.

2. IgM This is the first line of defense against infection.

3. IgE This is the skin sensitizing antigen. Allergies, dermatitis, etc.

4. IgD Its role is unclear.

5. IgG This is concerned with antibodies in general. (Hemolysis, complement fixation, transfusion reactions, etc.)

Tests for T & B Cells:[6] There are two main types of lymphocytes.

"B" cells make the antibodies that appear in the serum. B stands for Bursa of Fabricius. Serum protein electrophoresis is a crude way to assess the function of B cells. About 8% is normal.

"T" cells are lymphocytes programmed by the thymus. T cells are the heart of cellular immunity. T cells defend the body against viral infections and respond to self-antigens. 68% is about normal.

Null cells are neither B or T lymphocytes (24%).

Biopsy of scalp (or hair area). Alopecias have characteristic histologic findings[7].

Serology — lues

Hormone studies — Obviously male and female hormone assays seem important, but usually are not helpful in alopecias.

Treatment

Treatment of areata can be topically[8] applied or intradermally[9] injected steroids.

Treatment of *universalis is another situation. No* specific treatment is, at present, safe, efficient or beneficial. Research and controlled studies are in progress at various medical centers.

Reports[10] have shown that 5-FU topically has grown hair. Levamisole[11] is in trial usage. Systemic steroids have been tried extensively. Steroid usage should be carefully monitored and their side effects seriously considered. High dosages are necessary. Alternate day dosages are not so effective. Biotin[12,13] a "B" vitamin derivative is being promoted through mail order, beauty shops and "hair centers". First tried in hereditary or aging baldness, most doctors feel results are questionable in the areatas or in any hair situation.

Topical steroids[1] in higher strengths can be applied to the finger and toenails when involved.

HLA-B12 usage by Finnish[14] investigators and Kuntz[15] raises questions of hereditary transmission and genetic backgrounds. Presumably HLA antigens are elevated in areata, but absent in universalis.

Dinitrochlorobenze (DNCB) used in Germany is now being tested in areata. Rosenberg[16] and Daman[17] have found that DNCB, applied to the scalp hair loss areas, has grown hair elsewhere on the body in a small number of patients. DNCB *will* grow scalp hair. DNCB must be used at least three months before hair growth occurs. It causes an allergic dermatitis. In patients that failed to develop the dermatitis, H2 receptors, Cimetidine, were given and the looked for response appeared.

Most important area of treatment is psychiatric in many cases. Antidepressant drugs, busy work, patience, comfort of spouse, friends and doctors help the hairless patient face the world. Most helpful is self-insight that the patient himself must undergo. After complete examination, the patient must realize that he has *no* life threatening disease. Ego, self-pride, mirror reflections and feeling sorry for oneself are psychiatrically damaging. They are *not* life destructive. Tell the patient to face the world, socialize, play, work, keep busy, joke, explain and verbalize. Then the patient will overcome.

Summary

Alopecias are probably immunologic disorders? Much investigative work is being done. While steroids are possibly helpful, the side effects of long time high dosage must be considered. DNCB is promising.

Conclusion

Give careful supportive help to the hairless patient. He will face the world undaunted and hairless.

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11-17. Will be found on page 603.

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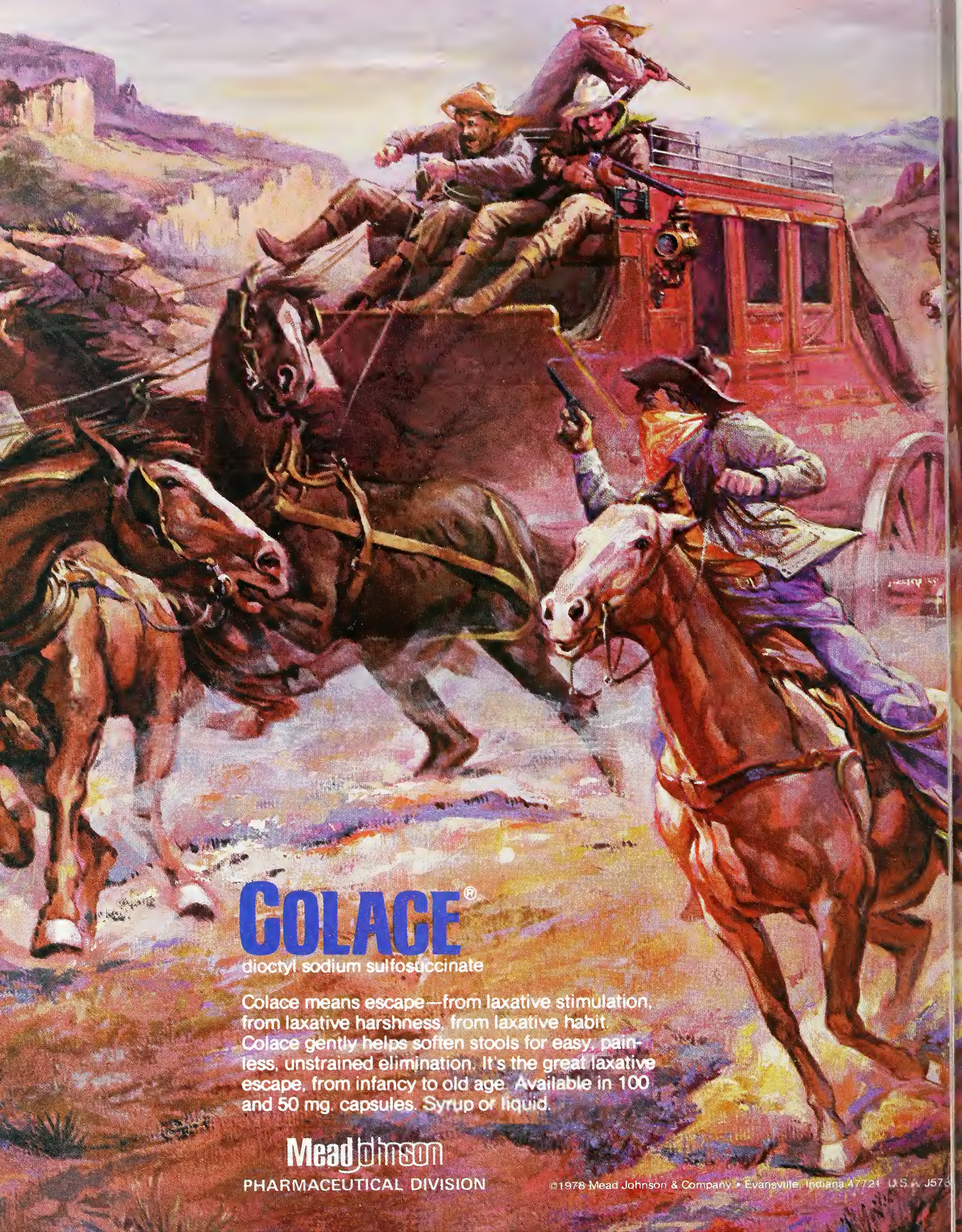
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Editorials

Surgical Reminiscences

THE ARTICLE SURGICAL Reminiscences marks this issue as one which many will read and keep to re-read. Its style is such that while reading it one feels that he is again in the company of Dr. Owen H. Wangensteen* to whom surgery and surgeons everywhere owe so much. He has capsulized the historical events surrounding the birth of the Surgery Department at the University of Minnesota and taken us on a guided tour along the path of its progress through the struggles of infancy and growth to its present strength and maturity. Along the way he has pointed to milestone events in the development of knowledge and the improvement in surgical treatment of disease.

The importance and magnitude of the contribution by Dr. Wangensteen and his colleagues to our understanding of the pathologic physiology of bowel obstruction and its rational treatment are recognized by all. Similarly we could recognize the effect of his presence in the areas of gastric physiology, appendicitis, thoracic and cardiac surgery as well as in a host of lesser interests. I think that his department flourished because his own accomplishments were great but primarily because his stature as a man allowed him to permit and encourage the unlimited professional growth of those about him.

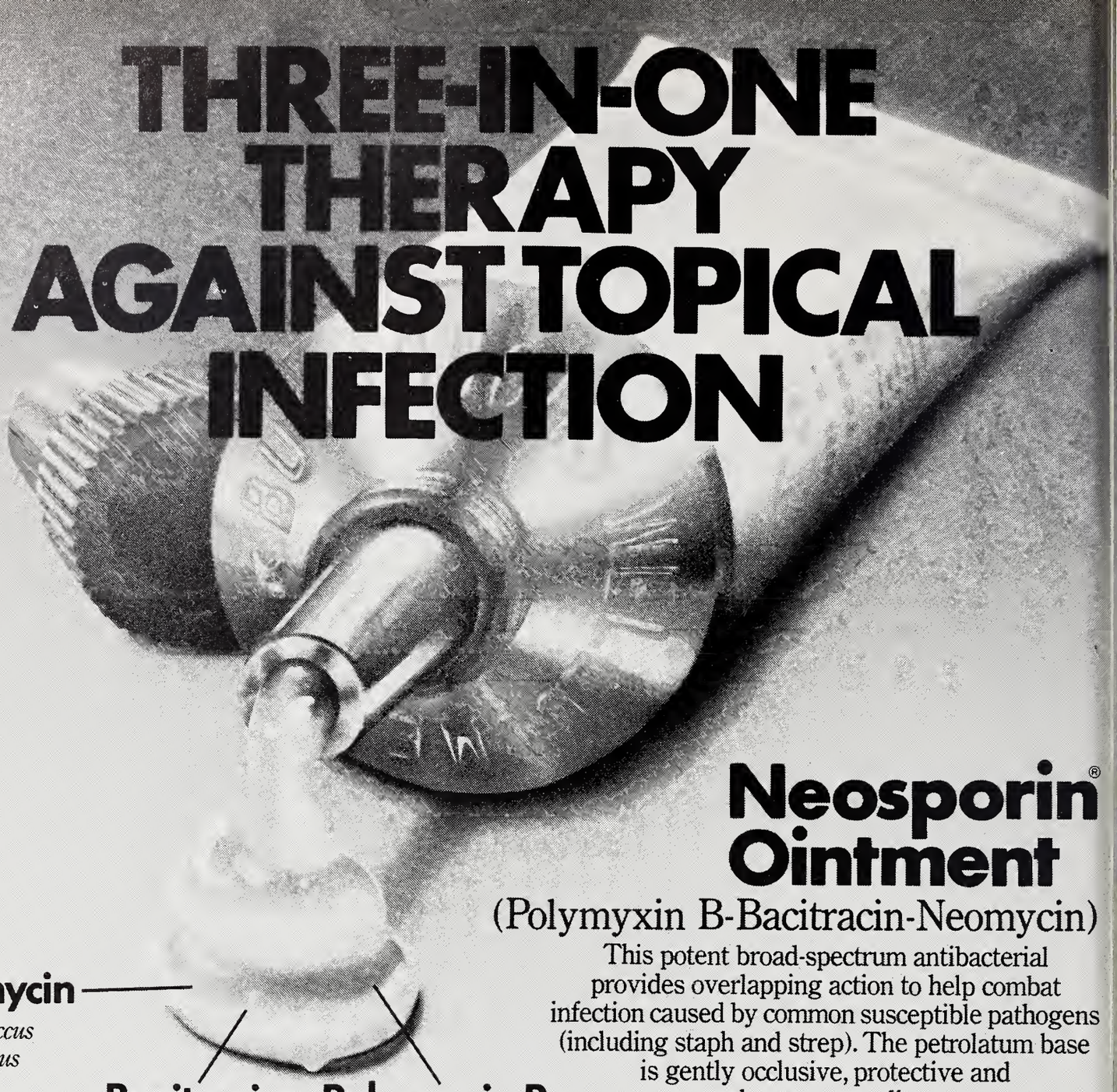
I was attracted to his anecdotal recollection of the treatment of severe infection of the extremity by mobilization in a double spica cast. We are reminded here of the importance that rest and elevation in relation to the heart play in the treatment of infection. This is a point often forgotten or neglected in this day of effective antibiotics and hospital beds with electric powered head rests.

His reference to a personal experience with appendicitis was especially interesting to me since I too as an early teenager suffered acute appendicitis. The year was 1930 and we lived in the small Minnesota town of Eagle Bend. The family practitioner made a proper diagnosis without benefit of laboratory work or X rays, and my parents were given the option of bed rest at home or surgery conducted in one of the upstairs rooms of the physician's residence under drop ether administered by his secretary who had no formal medical training whatsoever. Consultation for a second opinion was obtained from the practitioner in neighboring Parkers Prairie, and it was decided that the patient was too sick to undergo operation. Good fortune and the strength of youth brought gradual recovery after a period of three weeks. In terms of dollars the cost of this illness to society was nil and to my family was modest. In terms of risk and anxiety, however, its cost was significant. This is the fact which somehow must find a place in the formula for medical care being developed by modern health planners.

During Dr. Wangensteen's tenure and perhaps even up to the present it was proper to direct all thought and energy toward expanding the base of knowledge upon which the science of surgery is built while at the same time teaching sound principles of surgery and the

*See page 623.

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WARNING: Because of the potential hazard of nephrotoxicity and ototoxicity due to neomycin, care should be exercised when using this product in treating extensive burns, trophic ulceration and other extensive conditions where absorption of neomycin is possible. In burns where more than 20 percent of the body surface is affected, especially if the patient has impaired renal function or is receiving other aminoglycoside antibiotics concurrently, not more than one application a day is recommended.

When using neomycin-containing products to control secondary infection in the chronic dermatoses, it should be borne in mind that the skin is more liable to become sensitized to many substances, including neomycin. The manifestation of sensitization to neomycin is usually a low grade reddening with swelling, dry scaling and itching; it may be manifest simply as failure to heal. During long-term use of neomycin-containing products, periodic examination for such signs is advisable and the patient should be told to discontinue the product if they are observed. These symptoms regress quickly on withdrawing the medication. Neomycin-containing applications should be avoided for that patient thereafter.

PRECAUTIONS: As with other antibacterial preparations, prolonged use may result in overgrowth of nonsusceptible organisms, including fungi. Appropriate measures should be taken if this occurs.

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mechanics of technique. I believe that in the future, however, our academicians must take on an expanded role involving the economics of medical care and in helping society with its effort to obtain the best possible medical care at the lowest possible cost. It seems to me that those efforts will be most effective if they are exerted in a coordinated manner through the structure of organized medicine.

It is of concern, therefore, that so many of our full time institutional physicians are not members of organized medicine at any level. This is especially puzzling since dating back at least to the Flexner report, near the start of this century, the AMA has provided such strong support to our medical schools and at the state and county levels organized medicine is of course always active at those legislative sessions dealing with the medical school budget. Likewise, Veteran's Administration physicians who owe their improved position in a large measure to the strong lobbying efforts of the AMA strangely hold very limited membership in that organization.

Because of rising costs and involvement of a third party as payer our system of medical care is in a period of profound and rapid change. This change has already taken place in many countries around the world where physicians and the medical care system are now completely dominated and regulated by the government bureaucracy. Fortunately, in this country our system of government has slowed the progress in this direction. I believe that if we move quickly and effectively there is still time to influence the kind of medical care system that is ultimately developed for this United States.

Physicians really make up the only citizen group which understands the essential factors of good medical care and where economies can be effected without jeopardizing quality of care or growth of knowledge and technology. All physicians have a citizens' responsibility to become involved in the development of a new medical care system. Each of us may have valuable thoughts and ideas regarding this problem but to express them as individuals would be like voices in the wilderness. However, to have those individual thoughts tested, refined and orchestrated through the mechanism of organized medicine beginning at the county level and progressing through the state and national arms of the federation, our voices will be effective and echo in the chambers of the highest council of our government. Full time academicians, I believe, have as great or greater obligation and responsibility to help society plan wisely for medical care than any of us. I would hope, therefore, that those persons in leadership positions in our medical schools might find some way to educate students and staff regarding these obligations to society through active participation in the functions of organized medicine at all levels.

Frank E. Johnson, M.D.
President-Elect

Hair

ALOPECIA AREATA is one of the most common forms of hair loss seen by the physician. The word alopecia is derived from the Latin, alopex, meaning fox. These animals often suffer discrete areas of mange, resulting in bald areas.

Twenty centuries ago, Celsus described alopecia areata and to date the cause is unknown. The present interesting paper gives an excellent summary of the various tests that can be applied in these cases. However, as the author points out there still is no defined cause.

Today much emphasis has been placed on possible immunologic defects. In part this approach has resulted from the association at times of alopecia areata with chronic lymphocytic thyroiditis, adrenal insufficiency and pernicious anemia. In one study patients with alopecia areata were found to have circulating thyroid antibodies, parietal cell antibodies and adrenal cell antibodies. Of interest is that no antibodies against the hair follicle were demonstrated.[1] Further confusion has been created by a study reporting an antibody deficiency with intact cellular immunity in three children with alopecia areata.[2] These studies show that the cause of this condition still remains to be elucidated.

The author* of the present paper rightly emphasizes emotional support. At present no therapy is available which will regrow the lost hair with any certainty.

Willard C. Peterson, M.D.
Minneapolis, Minnesota

*See page 579.

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2. J Pediatr 89:728-731, 1976.

Sims explains traditional clothing in terms any doctor can understand.



Shirt: Cotton oxford cloth, button down collar with a slight roll at the neck.

Tie: Four-in-hand knot, 3¾″ or less in width, in a variety of English patterns and fabrics.

Lapel: Narrower, notched and gently rolling.

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Strictly from Hungary

To: MINNESOTA MEDICINE readers, State of Minnesota, U.S.A.
From: Editor, MINNESOTA MEDICINE, Budapest Hilton Hotel, Budapest, Hungary
Subject: Notes and Impressions of Communist Medicine

Dear Readers:

Think of this editorial as a postcard from Hungary.

We have been here four days and have heard three Hungarian physicians present papers to our group of touring American physicians. Four days allows only a fleeting glimpse of an ancient culture, and three papers do not a Hungarian medical expert make. Still I have notes and impressions I wish to share.

As I write these words, I am sitting in a plush hotel room, fit for any capitalist, in the Budapest Hilton Hotel — an architectural masterpiece that has been blended, integrated, and sculptured into the ruins of a medieval monastery that was mostly destroyed in World War II. The Communists, we note, lodge Western tourists in places built, financed, and conceived by imperialists and expose them to monuments and buildings erected in precommunist times by noncommunists. As an obligatory part of tours we are also shown a statue of Lenin or a huge Russian soldier to symbolize the "liberation" of Hungary.

The Budapest Hilton rides high on the crest of a hill in Buda, the older half of Budapest, and overlooks the heavily polluted Pest, which you can barely make out through the acrid smog. Smog, much of which is produced by ubiquitous two-cycle cars that chug up the hills here, is fogging contact lens and irritating eyes of American tourists.

The color you think of when you walk and ride around Budapest is gray. I don't know why Communists are called Reds. Grays would be better — Grays of the grim kind, When you look at the flaking, unkempt buildings here, you are reminded of these sentences in the Communist Manifesto: "The distinguishing feature of Communism is not the abolition of property generally, but the abolition of bourgeois property . . . In this sense, the theory of the Communists may be summed up in a single sentence: 'Abolition of private property.' " You see no pride of private ownership here. Nor do you note esthetic flair, such as stylish clothes, creative merchandising, or colorful displays. Most things are just gray — with occasional brown, black, or dull yellow hues.

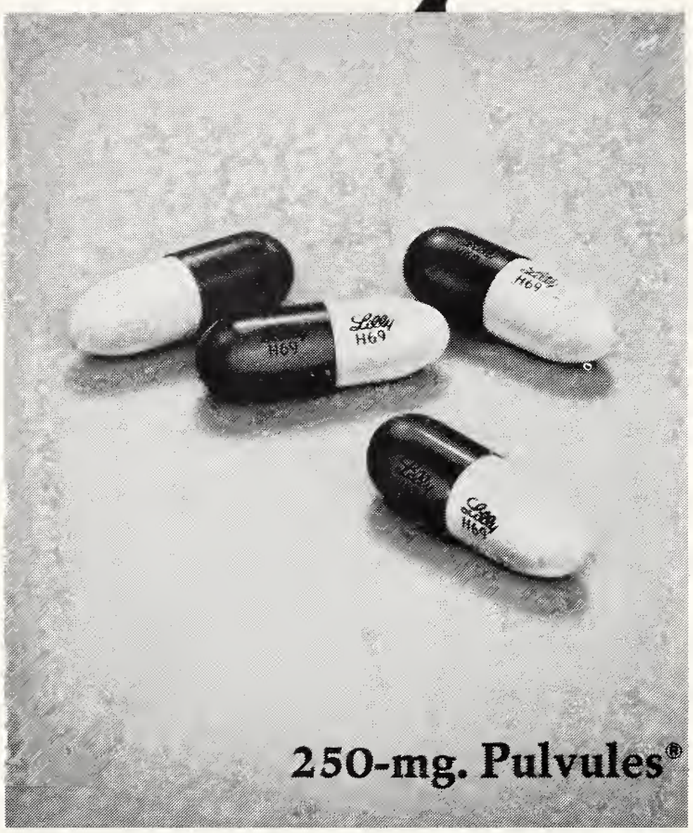
I cannot say much of the medical situation in Hungary, because I do not know much. The physicians who spoke to us were understandably nervous and stuck closely to the party line. There are about 430 patients for every physician — more than the United States. Four medical schools turn out roughly 2000 graduates a year, about half of whom are women. Competition for medical school is stiff, with three candidates for every position. Medical care, controlled by a centralized Ministry of Health, is "free", as are drugs and medical appliances. The entire fee for health insurance is paid by employers.

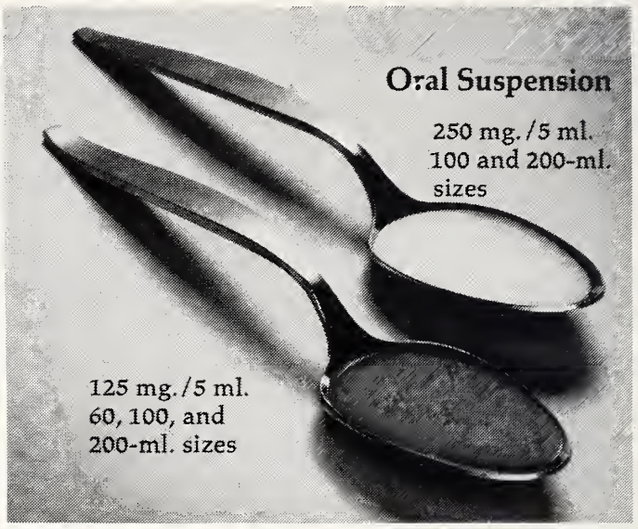
The three talks we heard were: (1) Radioresistant neoplasms and use of chemical radiosensitization; (2) The role of sialochemistry in diagnosis of parotid swellings; and (3) Medical care and welfare of women and mothers. Of these, the last was perhaps most interesting. In 1957, Hungary legislated unrestricted abortion. But when one abortion started to occur for every pregnancy carried to term, and the population stagnated, the legislature reversed itself in 1973 and limited indications for abortions. Now a family allowance is paid to parents having at least two children, and the amount increases with the number of children. I suspect the same sequence of events may happen in the United States if negative population growth occurs.

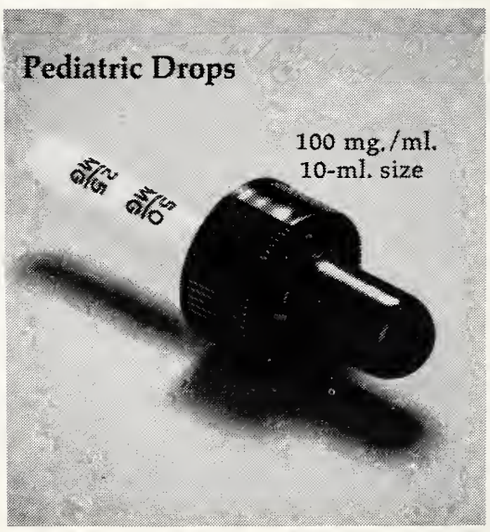
Before coming to Budapest, I spent a day in Czechoslovakia, which is more subjugated and even grayer than Hungary. From here, we go to Yugoslavia. Yugoslavia prides itself on its "independent" Communism. In 1948 Yugoslavia undertook a new "separate path to socialism" involving "decentralization and popular participation." But more on that later. This postcard is strictly from Hungary.

Richard L. Reece
Editor-in-Chief

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Rheumatology Corner

Examination of the Arthritic Patient

HARVINDER S. LUTHRA, M.D.*

WHEN EVALUATING a patient with musculoskeletal symptoms, a detailed history and physical examination including the musculoskeletal system helps in arriving at the correct diagnosis. In some rheumatic diseases, the presenting features may be directly related to the joints, such as rheumatoid arthritis, but in other rheumatic diseases the musculoskeletal symptoms may initially be very vague, such as systemic lupus erythematosus. One should keep in mind the possibility of other nonrheumatic systemic diseases which may present with musculoskeletal symptoms, for example, hemochromatosis or thyrotoxicosis.

It is essential that one obtain the details of the onset of symptoms including the area and pattern of involvement. Sometimes the first symptomatic area may point to the diagnosis, for example the first metatarsal phalangeal joint in gout or heel pain in ankylosing spondylitis or Reiter's Syndrome. Associated constitutional symptoms are helpful and one should inquire about morning stiffness or gelling phenomena, fever, skin rash, sun sensitivity, visual problems, pleurisy, pericarditis, weight loss, easy fatigability, keratoconjunctivitis sicca and xerostomia, color changes of the fingers on exposure to cold, etc. It is a good idea to assess the daily activities of the patient in regard to their work at home and on the job, as these may affect disease expression and may need to be modified in a good therapeutic program.

The musculoskeletal examination starts with the posture and gait of the patient which may help suspect a painful knee or hip, scoliosis, etc. Range of motion should be performed in all the joints. If one thinks in terms of the movement of his own joints, it is not difficult to remember the range of motion of a particular joint or get an idea of the limitation of motion seen in a particular patient.

Pain is a common presenting symptom in patients with rheumatic diseases, and tenderness in the joint should be looked for. This generally may be detected by palpating the joint margin as well as by passive range of motion of the joint. One should distinguish between point tenderness near the joint which may indicate inflammatory changes in the joint itself. Swelling of the joint may be bony as in degenerative osteoarthritis or of the soft tissues as in rheumatoid arthritis. In patients with active inflammation, synovitis generally would be reflected as boggy, doughy swelling which follows the reflections of the synovial lining and must be distinguished from diffuse swelling of the periarticular regions, such as swelling of the hand in shoulderhand syndrome or ankle swelling from dependent edema. Asymmetrical involvement, for example, of one knee or a couple of interphalangeal joints, may suggest diseases like Reiter's Syndrome or psoriatic arthritis while symmetrical involvement, for example of both wrists, elbows, and knees, may suggest rheumatoid arthritis or systemic lupus erythematosus.

A complete history and physical examination help in arriving at the proper diagnosis in a patient with rheumatic symptoms. Obviously, proper therapy can only then be recommended. It is not possible to discuss details of the history taking and physical examination in this brief note, but further reference will be made in this series as each joint is discussed. The reader is referred to larger texts for further details.

*Assistant Professor of Medicine, Mayo Medical School, Rochester, Minnesota.

Reference

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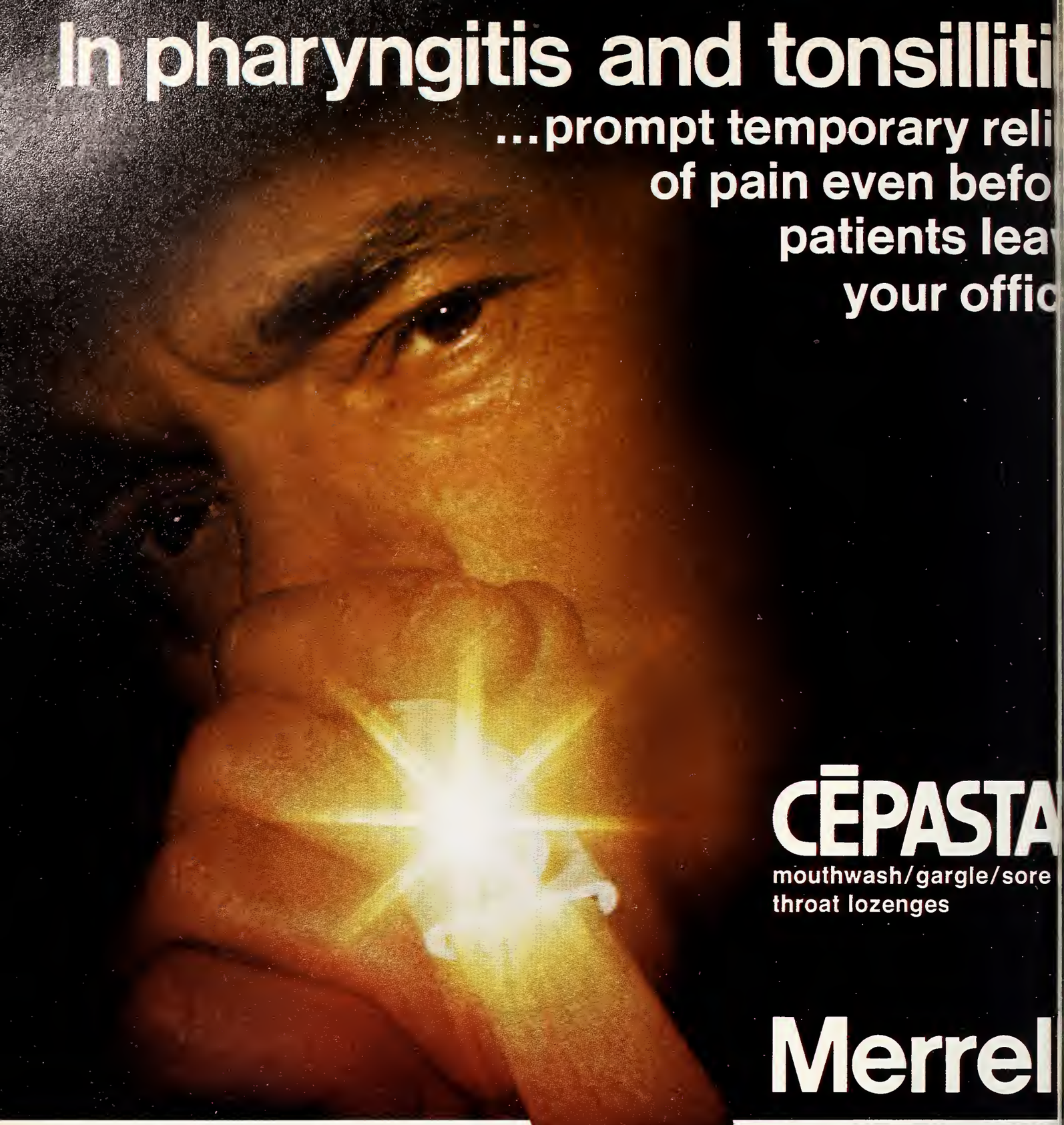
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Special Article

Mechanisms of Rapid Entry into the System

WILLIAM D. KIMBER, M.D., Chairman; MILLIE BROWN, R.N.; GLENN A. DEUTSCH, M.D.; JUDGE ROLAND FARICY, JR.; JAMES KENNEY, Ph.D.; SANDY LESTER, R.N.; G. PATRICK LILJA, M.D.; and PAUL O'DONOVAN, M.D.

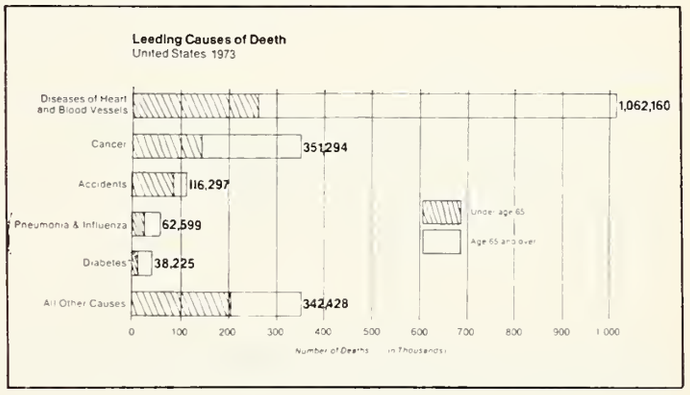
The working group considered the causes of delay in entry into the coronary care system in Minnesota. Major causes of delay originate in the patient himself and in the physician. Recommendations included large scale public education in signs and symptoms of myocardial infarction plus methods of efficient entry into a community's system. Physician education in rapid system entry and improved central communications including 911 were recommended. Causes of delay in Minnesota's coronary care system are considered. Patient and physician delay and an inefficient communications system are major problems. Recommendations included large scale public education programs, physician education in life support and regional communications, i.e. 911.

SUDDEN DEATH and angina pectoris have been associated for 200 years.[1] During the past five years the magnitude of the absolute loss of human life due to ischemic heart disease (IHD) has been widely publicized. Of the 1.8 million deaths in the United States each year, approximately 1.2 million deaths are related to cardiovascular disease. Of these, 650,000 died of ischemic heart disease. Over half (350,000) of these deaths occurred before the victims were able to reach the hospital. Sixty percent of these pre-hospital deaths (225,000) occur within the first two hours after the onset of the acute episode.[2] Delays of three to six hours are commonly noted before the patient can be given adequate medical care, thus contributing to high early mortality. See Figure 1.

In Minnesota, 54% of all deaths recorded are the results of heart attack, stroke, or other cardiovascular disease. A Minnesotan dies of heart disease approximately every 28 minutes. An entire community the size of Hibbing, over 18,500 people, die of cardiovascular disease annually in this state. In 1976, the estimated economic cost of cardiovascular disease to Minnesota industry alone will approximate 17 million dollars.[3]

The pre-hospital mortality due to ischemic heart disease is the single commonest cause of death in men 40 - 64 years of age. Acute ischemic heart disease is this nation's greatest health problem.[4] See Figure 2.

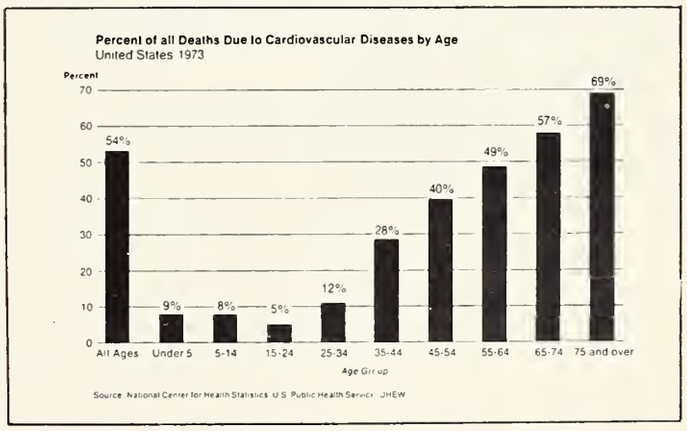
There is data now from a number of centers which show that efficient use of well-organized mobile emergency cardiac care can appreciably reduce the early high mortality from ischemic heart disease. In one study,[4] 25% of patients found in ventricular fibrillation were resuscitated and discharged home. Other studies support these findings. In addition, when delay is minimal, as when patients develop ventricular



Source: National Center for Health Statistics, U.S. Public Health Service, DHEW. By permission.

Source: Excerpt from American Heart Association 1976 Heart Facts. By permission.

Figure 1



Source: National Center for Health Statistics, U.S. Public Health Service, DHEW. By permission.

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Figure 2

American Heart Association Minnesota Affiliate, Inc. Conference on Stratified Coronary Care, Pine Portage, Brainerd, Minnesota, June 10-11, 1976.

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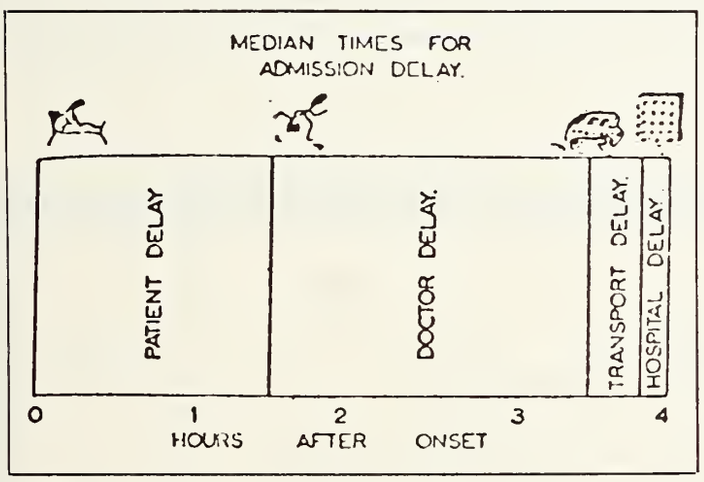
fibrillation while under surveillance for expected cardiac difficulties, 37% were resuscitated and discharged home.[4] Thus, the contention that little can be done to prevent patients dying within the first few hours after the onset of symptoms seems overly pessimistic.

Key Questions

What are the causes of delay of entry into the coronary care system and what can be done about these delays? What are the most frequently used systems of entry in the state; what shortcomings do they have? What is the status of development of an emergency centralized communications center (e.g., 911); does it decrease delay? What role does (can) public and professional education play in determining entry time. What role does cost play in the present system and how much will new systems cost?

Causes of Delay

The delay in instituting definitive medical care can be attributed to several factors: (1) patient delay, (2) physician delay, (3) transport delay, and (4) hospital admission delay.[4] See Figure 3.



Source: Norris, RM, Caunt, VS: Delay in Admission to a Coronary Care Unit. New Zealand Med J 78:342, October 23, 1973. By permission.

Fig. 3 — The components of admission delay to a coronary care unit. The times shown approximate to the median for each delay period in 153 patients.

1. Patient Delay

The first delay takes place between the patient's recognition of distinctive symptoms and his decision to seek medical help. This decision requires: (1) knowledge of the usual symptoms of acute ischemic heart disease, (2) recognition of the necessity for seeking prompt medical assistance, and (3) knowledge of how to obtain assistance in his own community.[2,5,6] The delay involved in these steps often occupies three to six hours of therapeutically crucial time. Ignorance, denial of symptoms, rationalization and socio-economic factors all may contribute to delay in seeking assistance.[5] We must provide the patient with systematic, organized, reasonable criteria for judging when to seek assistance.

2. Doctor Delay

Doctor delay consists of several components: (1) failure to utilize existing emergency cardiac systems, (2) inappropriate advice to the patient, (3) physician misinterpretation of significant symptoms recognized by the patient. Sometimes physicians contribute to the delay by using the same psychologic mechanisms as patients, i.e., rationalization and denial.

3. Transport Delay

The transport delay consists of the lag between the request for assistance and its arrival. This lag, depending on the availability of transportation and distance varies from hours in an isolated community to minutes in a metropolitan area with special emergency services. This delay is obviously more important when a poorly equipped ambulance arrives with inadquately trained personnel.

4. Hospital Delay

Hospital delay is composed of several factors: (a) absence of protocols for prompt assessment of chest pain in the emergency room, (b) inadequate staffing, (c) insufficiently trained personnel, and (d) inadequately equipped emergency rooms. Prompt assessment and surveillance of patients with acute chest pain demands priority over many medical emergencies which are not immediately life threatening. See Figure 4.

Further study is required to clarify the many factors involving the patient's emotional and cognitive functions, as well as the social resources available to him, which contribute to the inappropriate delay in the pre-hospital phase of acute myocardial infarction.[6] Thus, patient-oriented and community educational programs should be developed to reduce the times for patient and doctor delay. It is also pertinent to consider arrangements that range from the mobile, fully equipped Coronary Care Unit through mobile arrhythmia units, with and without professional staff and telemetry, to a rapid retrieval standard ambulance system. There seems little doubt that in most settings decreasing delay will save some lives. The critical problem is to design the operation so that each community makes the most effective use of available personnel and resources.

Emergency Cardiac Care System

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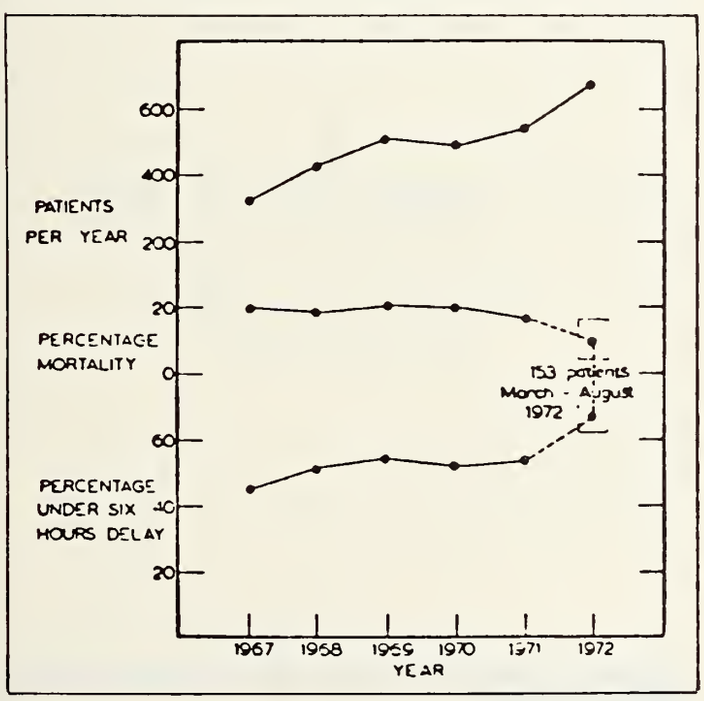
medical attention for symptoms suggestive of acute myocardial infarction, rapid access into the system is essential.

Many problems in early coronary care relate directly to inadequate mechanisms for obtaining prompt medical attention. These mechanisms will have to be developed locally and each community should accept its responsibility for defining such pathways based on the needs of the population at risk.

Patients in most communities seek medical care in emergencies by attempting to reach their physician or an emergency room, an ambulance, or a rescue squad. This non-system has many deficiencies. The long delay between the decision to seek help and the establishment of effective monitoring and therapy is the most pressing need.

New community response systems must be developed. We strongly recommend the establishment of a central communications system for emergencies using the 911 System.[7,9] This service should use qualified personnel to triage emergency calls and promptly dispatch medical assistance as indicated.

A "central communications system" includes a system command and control center which is responsible for establishing those communication channels and providing those public resources essential to the most effective and efficient emergency medical services managment of the immediate problem. It must have the necessary equipment and facilities to permit immediate interchange of information essential for the system's resource management and control. The essentials of such a communications center are that: (1) all requests for system response are directed to the center, (2) all system resource response is directed from the center, and (3) all system liaison with other public safety and emergency response system is coordinated from the center.



Source: Norris, RM, Caunt, VS: Delay in Admission to a Coronary Care Unit. New Zealand Med J 78:342, October 23, 1973.

Fig. 4 — Coronary Care Unit, Green Lane Hospital, 1967-1972. Total admissions with percentage hospital mortality of patients with myocardial infarction, and percentage of patients admitted within six hours of onset of infarction.

Mobile Life Support Units are an integral part of an effective emergency cardiac care system, but will not be defined by the authors. A high level of cardiopulmonary resuscitation (CPR) and basic life support training among the public would greatly extend the efficacy of an emergency cardiac care system.[8]

Local differences in population, resources and transport abilities may require alternative solutions to emergency cardiac care systems. It should be recognized that such alternatives would be temporary and less than optimal. Such alternative systems should be developed in cooperation with local medical societies and other health agencies.

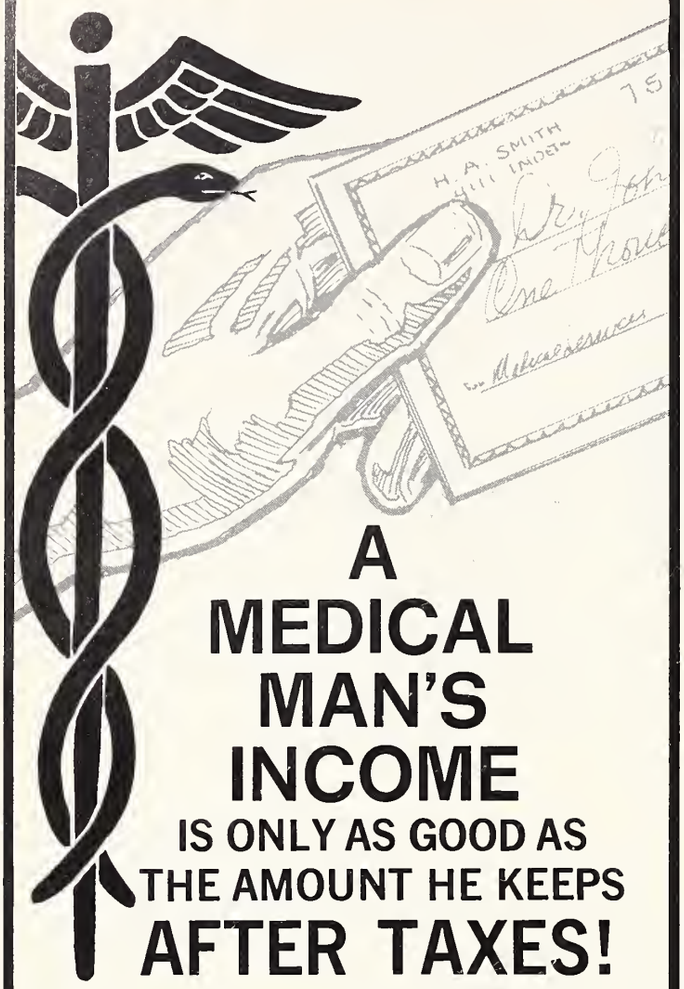
Education

Currently, there is inadequate public awareness of the problem of pre-hospital acute cardiac deaths. A major public and professional educational program should be launched to teach: (1) the incidence of coronary artery disease, (2) the significance of coronary risk factors, (3) the common early symptoms of acute ischemic events, and (4) the effectiveness of prompt medical care in altering the immediate prognosis of the disease.

1. High Risk Individuals

Individuals at high risk for coronary artery disease and/or sudden death should be identified because they are a particular target population for this educational message. This group includes those with a family history of ischemic heart disease and those with hypertension, a history of cigarette smoking, hyperlipidemia, or diabetes mellitus.

Individuals, especially those with known ischemic heart disease and those with one or more coronary risk factors, should seek immediate entry into the system of emergency coronary care if they develop severe pain or oppressive discomfort in the retrosternal region, especially if it radiates to the arms or neck and does not promptly disappear. Although acute myocardial infarction can be present with other symptoms, the characteristics noted above are sufficiently sensitive and specific to serve as a warning message directed to the general public.



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Patients with stable angina pectoris should enter the system of emergency coronary care if they experience an increase in frequency or severity of the pattern of their angina. Expanded public education may produce a large number of false alarms. However, the number of lives saved should justify the inconvenience and cost in terms of time and dollars. Analysis of false alarms should result in improvement of the educational program and adjustment of the system to handle these cases more effectively.

Equally important in public education is the clear identification for the patient of effective pathways for rapid entry into the system.

2. Public Education

Public education should include:

a. School education campaign for children and young adults using an emergency cardiac care curriculum package given to the State Department of Education containing a short course on (a) the anatomy of the heart, (b) pathology of coronary heart disease, (c) risk factors for coronary artery disease, (d) warning symptoms for acute ischemic events, and (e) description of mechanisms of rapid entry into the system.

b. An advertising type campaign using mass media (e.g., television, radio and newspapers) for adult education using the emergency cardiac care curriculum.

c. T.V. and radio spots emphasizing early warning signs and symptoms, emergency cardiac care system and how to enter it should be given at the time of each significant snowfall, during the hunting season and other appropriate times.

d. Other methods of public education would include: articles in local newspapers, ads in local papers, local T.V. and radio talk shows, use of speakers bureau kit, and use of "give away" brochures at fairs, exhibits or as stuffer pieces.

e. Basic life support training priorities should include a program guide for cardiopulmonary resuscitation (CPR) training of patient's family prior to hospital discharge and a program guide for cardiopulmonary resuscitation (CPR) training for patient's co-workers prior to his return to work.

3. Professional Education

Health professionals must recognize that more than half the patients with acute myocardial infarction have prodromal symptoms, including progressive or crescendo chest pain within one week before the onset of the acute attack (they frequently have consulted a physician during this time). To improve the response to the individual seeking help, physicians and other health personnel likely to make primary contact with the patient experiencing symptoms of acute myocardial infarction should be educated in the following areas:

a. Recognition of the signs and symptoms of impending acute myocardial infarction, and the urgency for prompt entry into the system of care.

b. Familiarity with community resources and facilities so that the patient can be advised how to secure definitive coronary care as rapidly as possible.

c. The ability to perform cardiopulmonary resuscitation (CPR).

d. Understanding by the physician of the indications and uses of basic medications in the treatment of cardiac arrhythmias.

To date, few communities have an adequate system for providing emergency cardiac care. The Minnesota Medical Association should be contacted and its advice solicited in implementing a physician education program. Each county medical society should be contacted to explain the concept of Stratified Coronary Care and seek its assistance in implementing the community recommendations in its locale and encourage development of its own emergency cardiac care system.

Conclusions

1. Acute ischemic heart disease is the single greatest cause of death in Minnesota (as in the United States).
2. Most deaths occur during the pre-hospital phase of the acute episode, usually within 2 hours after its onset.
3. Minimizing delay between onset of the acute episode and appropriate treatment reduces mortality.
4. Delay in instituting medical care has multiple causes involving intellectual and psychological mechanisms of the patient and doctor; technical factors in transportation; and adequate administration, equipment and training of personnel.
5. Decreasing delay, i.e., facilitating rapid entry into the health care system, saves lives.
6. Reducing times of delay can be accomplished by (a) informing health professionals and the general public of the risk factors for and signs of acute ischemic heart disease, (b) using a central communications system, (c) designing faster response transportation and (d) continuous investigation of more efficient mechanisms of rapid entry into the system.

References will be found on page 603.

Minnesota Medical Association Criteria

Brain Death
Concept and Criteria

RONALD E. CRANFORD, M.D.

In last month's *Minnesota Medicine**, three issues were discussed: the establishment of an Ad Hoc Committee on Death of the Minnesota Medical Association; the formulation of brain death legislation; and the development and promulgation of brain death criteria which were included in their entirety. This month, the criteria will be examined in greater detail.

There is a crucial distinction between the *concept* and the specific medical *criteria* of brain death. None of the eighteen states passing brain death legislation by the end of 1977 had incorporated specific medical criteria into their laws.

The Minnesota criteria, explicitly recognizing this distinction, stress that the criteria must be in essential agreement with the concept. In the introductory paragraph it is stated, "These essential criteria conform to the concept of brain death, that is, irreversible cessation of total brain function determined by clinical examination." This latter phrase, "irreversible cessation of total brain function determined by clinical examination," is almost identical to the phrase adopted in the MMA statutory proposal, "irreversible cessation of clinically determined total brain function." This wording is also substantively consistent with the phrase used in the bill introduced for legislative hearings, S.F. No. 253, "irreversible cessation of the function of the entire brain." Any set of established criteria for the determination of brain death must be consistent with the essential elements in the concept of brain death.

The Minnesota guidelines delineate between the necessary and essential criteria that must be observed in all cases of brain death (cerebral unresponsivity, apnea, absent brain stem reflexes, and establishment of irreversibility) from various confirmatory tests and procedures, such as electroencephalography (EEG), four-vessel angiography, and radioisotope studies.

During the last decade, there has been considerable controversy concerning the precise role of confirmatory procedures in the diagnosis of brain death, most notably the EEG. Some physicians have reasoned that since the EEG is of great value in selected cases, it should be considered mandatory in all cases. This reasoning is fallacious. The Harvard criteria,† published in 1968, and well accepted by the medical community, state "of great confirmatory value is the flat or isoelectric EEG." It is the opinion of the MMA Ad Hoc Committee on Death that the EEG falls in the category of confirmatory tests and can provide valuable, supportive data and objective documentation in selected cases, but is not essential in every case. The committee feels that the decision to use the EEG or other confirmatory tests should be left to the judgment of the attending physician.

Criteria 1 through 3 should be self-explanatory and require no elaboration except to point out that spinal segmental reflexes have been clearly excluded as a necessary element. Except for this latter exclusion, these first three criteria closely parallel items 1 through 3 in the Harvard criteria.

An essential aspect of the determination of brain death is the establishment of irreversibility. The Minnesota criteria (item #5) do not recommend any specific procedures or laboratory screening to establish irreversibility; the selection of confirmatory procedures is the responsibility of the attending physician in each individual case. While it is not mandatory to establish a definite etiology in every case, there must be no reasonable possibility of a reversible CNS dysfunction.

The period of observation (item #4) relates to the establishment of irreversibility. The Harvard criteria state that all tests for brain death "shall be repeated at least 24 hours later with no change." Other criteria formulated throughout the United States vary in this time interval from two hours to longer than twenty-four hours. The primary objectives of this period are to conduct whatever studies or further examinations are indicated to establish irreversibility, and to ensure that at least two separate clinical examinations are performed. Therefore, the twelve hours selected by the Ad Hoc Committee is somewhat arbitrary, but reflect what we feel is a reasonable standard of medical practice at this time in the majority of cases.

In some cases, it may be evident to the clinician that a period of observation of twelve hours is unnecessary. When a patient is admitted with severe, open head

*See page 561.

†A definition of irreversible coma, Report of the Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death. JAMA 205: 337-340, 1968.

trauma, and examination reveals no evidence of brain functioning, the clinician may reasonably conclude that not only has the brain stopped functioning, but that the overt, observable injuries to the brain clearly establish an irreversible process. In such cases, the physician may thus determine that a further period of observation is unnecessary. In other cases, it may be medically indicated to wait longer than twelve hours, even several days, if the clinician is uncertain about the clinical circumstances. Such a situation exists, for example, when a history is unavailable. In these instances, the possibility of drug intoxication must be excluded. It is well known that random laboratory screening is not sufficient to rule out all causes of drug intoxication. Therefore, it may be appropriate to wait several days until the physician can be assured that any drugs which could suppress brain function have been metabolically cleared from the body.

There are no substantive differences between the Harvard and Minnesota criteria, but four variations should be noted. First, medical evidence accumulated over the past ten years since the publication of the Harvard criteria has established that spinal cord reflexes may be present when there is a total cessation of brain functioning. The Harvard criteria do not address this specific issue, yet imply that all reflexes, including spinal cord reflexes, should be absent before a person is pronounced dead. In both items 1 and 3 of the Minnesota guidelines, it is recognized that spinal segmental responses may be present in cases of brain death.

Second, the Harvard criteria specify fixed and *dilated* pupils (presumably 7 mm. or greater in diameter). As the Minnesota criteria state, the pupils may be mid-position; that is, 5 mm. or greater when there has been unequivocal destruction of the brain stem. Cases have been reported (this author has seen at least three cases) in which the pupils have been smaller than 5 mm. with autopsy documentation of total brain destruction. However, a physician should be extremely hesitant to diagnose brain death in the presence of pupils smaller than 5 mm., since drug intoxication can mimic brain death and may produce small pupils.

Third, as previously discussed, the Harvard criteria recommend an arbitrary period of observation of twenty-four hours, while the Ad Hoc Committee feels that twelve hours is reasonable. The most significant element in the period of observation is not the time interval per se, but whatever duration is necessary to determine irreversibility.

Fourth, the Ad Hoc Committee is in essential agreement with the Harvard criteria concerning the confirmatory value of an isoelectric EEG (electrocerebral silence). In view of the ongoing controversy on the value of various confirmatory tests, the Ad Hoc Committee strongly adheres to the position that the EEG falls within the confirmatory category and further recommends that all determinations regarding the role of any confirmatory procedures should be made by the attending physician.

It should be pointed out that, although the Harvard criteria indicate that at least two separate EEG determinations should be performed, revised standards of the American EEG Society (1976) now recommend that only one EEG documenting electrocerebral silence is necessary. The EEG Society adds, however, that if there is doubt concerning electrocerebral silence, a repeat EEG may be necessary. If an EEG is obtained to confirm the clinical diagnosis of brain death, it should conform to the specific standards for the determination of electrocerebral silence established by the American EEG Society.

During the process of formulating these criteria, the Ad Hoc Committee became aware of several important principles regarding the pronouncement of brain death, some of which have been incorporated into a section entitled, "Procedural Guidelines."

The Harvard criteria state that, "Death is to be declared and *then* the respirator turned off. The decision to do this and the responsibility for it are to be taken by the physician-in-charge, in consultation with one or more physicians who have been directly involved in the case. It is unsound and undesirable to force the family to make the decision." If the pronouncement of brain death is as medically and legally valid as the pronouncement of cardiorespiratory death, then the physician is morally and legally obligated to pronounce the patient dead once the medical criteria have been satisfied, either for brain or cardiorespiratory death. From a legal standpoint, as stated in the Minnesota criteria, the consent of the family is not required. However, the attending physician should discuss the facts surrounding the brain death concept with the family to determine if they have any significant objections or reservations. Every reasonable effort should be made to resolve these concerns before the patient is pronounced dead. This is a dilemma that the physician will continue to face until the brain death concept has been more fully accepted by society and the public recognizes that brain death signifies the death of the person.

When all the criteria for brain death have been satisfied, including the establishment of irreversibility, and the relevant issues have been discussed with the

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family, the patient shall then be pronounced dead. However, the time of death, the most significant time from a medical-legal standpoint, is when the brain first ceases to function, or, as stated in the Minnesota criteria, when the irreversible cessation of brain function is first *noted*, i.e. "the first observation." Physicians should be aware of this difference between the *time* of death and the *pronouncement* of death. The issue of the precise time when a patient dies has significant legal implications regarding insurance, inheritance, survivorship, and other matters. In addition, the question arises concerning financial responsibility for medical care during this period of evaluation between the initial observation of brain death and the final pronouncement. These issues have not been adequately resolved as yet and merit extensive discussion and cooperation between members of the medical and legal professions, governmental representatives, and private insurance companies.

These criteria also recognize the distinction between the pronouncement of death versus the issue of allowing to die, and between total brain death and lesser degrees of brain damage, such as the persistent vegetative state. These distinctions are stated in the last paragraph of the procedural guidelines: "From the medical, moral, and legal standpoint it is absolutely essential to separate the issues of when a person should be pronounced dead from when a person should be allowed to die. These recommendations are not intended to provide any operational guidelines to decide when extraordinary means of support should be discontinued in a patient who, although has severely and irreversibly brain damage, fails to satisfy all the criteria for irreversible cessation of functioning of the brain." It is the obligation not only of the Ad Hoc Committee on Death and the Minnesota Medical Association but also the entire medical community to clearly distinguish between these two related issues.

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ole, D.R., et al.: Antimicrob. Ag. Chemother. 11(6):1033-1035 (June) 1977.

ue penetration is essential to therapeutic efficacy; however,
cific tissue levels have not been directly correlated with specific
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**ore prescribing, see complete prescribing information
SK&F literature or PDR. The following is a brief summary.**

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d group A beta-hemolytic streptococci.

ctable benzathine penicillin is considered to be the drug of choice
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prophylaxis of rheumatic fever. 'Ancef' is effective in the eradica-
of streptococci from the nasopharynx; however, data establishing
efficacy of 'Ancef' in the subsequent prevention of rheumatic
er are not available at present.

nary tract infections due to Escherichia coli, Proteus mirabilis,
bsiella species, and some strains of enterobacter and enterococci.

n structure infections due to Staphylococcus aureus (penicillin-
sitive and penicillin-resistant), group A beta-hemolytic streptococci
d other strains of streptococci.

ary tract infections due to Escherichia coli, various strains of
ptococci, Proteus mirabilis, Klebsiella species and Staphylococcus
reus.

ne and joint infections due to Staphylococcus aureus.

enital infections (i.e., prostatitis, epididymitis) due to Escherichia coli,
teus mirabilis, Klebsiella species, and some strains of enterococci.

pticemia due to Streptococcus pneumoniae (formerly D.
eumoniae), Staphylococcus aureus (penicillin-sensitive and
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(Continued to Page 622)

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Tenuate®
(diethylpropion hydrochloride NF)

Tenuate Dospan®
(diethylpropion hydrochloride NF) controlled-release

AVAILABLE ONLY ON PRESCRIPTION
Brief Summary
INDICATION: Tenuate and Tenuate Dospan are indicated in the management of exogenous obesity as a short-term adjunct (a few weeks) in a regimen of weight reduction based on caloric restriction. The limited usefulness of agents of this class should be measured against possible risk factors inherent in their use such as those described below.
CONTRAINDICATIONS: Advanced arteriosclerosis, hyperthyroidism, known hypersensitivity, or idiosyncrasy to the sympathomimetic amines, glaucoma. Agitated states. Patients with a history of drug abuse. During or within 14 days following the administration of monoamine oxidase inhibitors, (hypertensive crises may result).
WARNINGS: If tolerance develops, the recommended dose should not be exceeded in an attempt to increase the effect; rather, the drug should be discontinued. Tenuate may impair the ability of the patient to engage in potentially hazardous activities such as operating machinery or driving a motor vehicle; the patient should therefore be cautioned accordingly. *Drug Dependence:* Tenuate has some chemical and pharmacologic similarities to the amphetamines and other related stimulant drugs that have been extensively abused. There have been reports of subjects becoming psychologically dependent on diethylpropion. The possibility of abuse should be kept in mind when evaluating the desirability of including a drug as part of a weight reduction program. Abuse of amphetamines and related drugs may be associated with varying degrees of psychologic dependence and social dysfunction which, in the case of certain drugs, may be severe. There are reports of patients who have increased the dosage to many times that recommended. Abrupt cessation following prolonged high dosage administration results in extreme fatigue and mental depression; changes are also noted on the sleep EEG. Manifestations of chronic intoxication with anorectic drugs include severe dermatoses, marked insomnia, irritability, hyperactivity, and personality changes. The most severe manifestation of chronic intoxications is psychosis, often clinically indistinguishable from schizophrenia. *Use in Pregnancy*: Although rat and human reproductive studies have not indicated adverse effects, the use of Tenuate by women who are pregnant or may become pregnant requires that the potential benefits be weighed against the potential risks. *Use in Children*: Tenuate is not recommended for use in children under 12 years of age.
PRECAUTIONS: Caution is to be exercised in prescribing Tenuate for patients with hypertension or with symptomatic cardiovascular disease, including arrhythmias. Tenuate should not be administered to patients with severe hypertension. Insulin requirements in diabetes mellitus may be altered in association with the use of Tenuate and the concomitant dietary regimen. Tenuate may decrease the hypotensive effect of guanethidine. The least amount feasible should be prescribed or dispensed at one time in order to minimize the possibility of overdosage. Reports suggest that Tenuate may increase convulsions in some epileptics. Therefore, epileptics receiving Tenuate should be carefully monitored. Titration of dose or discontinuance of Tenuate may be necessary.
ADVERSE REACTIONS: *Cardiovascular*: Palpitation, tachycardia, elevation of blood pressure, precordial pain, arrhythmia. One published report described T-wave changes in the ECG of a healthy young male after ingestion of diethylpropion hydrochloride. *Central Nervous System*: Overstimulation, nervousness, restlessness, dizziness, jitteriness, insomnia, anxiety, euphoria, depression, dysphoria, tremor, dyskinesia, mydriasis, drowsiness, malaise, headache; rarely psychotic episodes at recommended doses. In a few epileptics an increase in convulsive episodes has been reported. *Gastrointestinal*: Dryness of the mouth, unpleasant taste, nausea, vomiting, abdominal discomfort, diarrhea, constipation, other gastrointestinal disturbances. *Allergic*: Urticaria, rash, ecchymosis, erythema. *Endocrine*: Impotence, changes in libido, gynecomastia, menstrual upset. *Hematopoietic System*: Bone marrow depression, agranulocytosis, leukopenia. *Miscellaneous*: A variety of miscellaneous adverse reactions has been reported by physicians. These include complaints such as dyspnea, hair loss, muscle pain, dysuria, increased sweating, and polyuria.
DOSAGE AND ADMINISTRATION: Tenuate (diethylpropion hydrochloride): One 25 mg. tablet three times daily, one hour before meals, and in midevening if desired to overcome night hunger. Tenuate Dospan (diethylpropion hydrochloride) controlled-release: One 75 mg. tablet daily, swallowed whole, in midmorning. Tenuate is not recommended for use in children under 12 years of age.
OVERDOSAGE: Manifestations of acute overdosage include restlessness, tremor, hyperreflexia, rapid respiration, confusion, assaultiveness, hallucinations, panic states. Fatigue and depression usually follow the central stimulation. Cardiovascular effects include arrhythmias, hypertension or hypotension and circulatory collapse. Gastrointestinal symptoms include nausea, vomiting, diarrhea, and abdominal cramps. Overdose of pharmacologically similar compounds has resulted in fatal poisoning, usually terminating in convulsions and coma. Management of acute Tenuate intoxication is largely symptomatic and includes lavage and sedation with a barbiturate. Experience with hemodialysis or peritoneal dialysis is inadequate to permit recommendation in this regard. Intravenous phentolamine (Regitine®) has been suggested on pharmacologic grounds for possible acute, severe hypertension, if this complicates Tenuate overdosage.

Product Information as of April, 1976
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Direct Medical Inquiries to:
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References: 1. Citations available on request—Medical Research Department, MERRELL RESEARCH CENTER, MERRELL-NATIONAL LABORATORIES, Cincinnati, Ohio 45215. **2.** Hoekenga, M.T., O'Dillon, R.H., and Leyland, H.M.: A Comprehensive Review of Diethylpropion Hydrochloride. International Symposium on Central Mechanisms of Anorectic Drugs, Florence, Italy, Jan. 20-21, 1977.

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(diethylpropion hydrochloride NF)
75 mg. controlled-release tablets



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Overweight patients in certain diagnostic categories often require strict obesity control. Diethylpropion hydrochloride has been reported useful in obese patients with hypertension, symptomatic cardiovascular disease, or diabetes. While it is not suggested that Tenuate in any way reduces these complications in the overweight, it may have a useful place as a short-term adjunct in a prescribed dietary regimen. (Tenuate should not be administered to patients with severe hypertension; see additional Warnings and Precautions on the opposite page.)

In uncomplicated obesity.

Many patients, on the other hand, present with excess fat but no disease. While this condition is often termed uncomplicated obesity, complications of both a social and a psychologic nature may be distressingly real for the patients. In these cases, a short-term regimen of Tenuate can help reinforce your dietary counsel during the important early weeks of an indicated weight loss program.

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The anorexic effectiveness of diethylpropion hydrochloride is well documented. No less than 16 separate double-blind, placebo-controlled studies attest to its usefulness in daily practice.[1] And the unique chemistry of Tenuate provides "...anorexic potency with minimal overt central nervous system or cardiovascular stimulation."[2] Compared with the amphetamines, diethylpropion has minimal potential for abuse.

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Conversation with Mr. Carl N. Platou, President of Fairview Community Hospitals.



Mr. Carl N. Platou* Dr. Richard Reece

Dr. Richard Reece:

Mr. Platou, what is your present position, and how long have you held it?

Mr. Carl N. Platou:

I'm president of Fairview Community Hospitals. I've been at Fairview 25 years now and came as administrator. We had 178 beds then and we've grown to 545. Later we started an Edina satellite hospital of 223 beds. We've grown now and have some 22 hospitals throughout Minnesota.

Dr. Reece:

What is your educational background?

Mr. Platou:

I have a masters degree in hospital administration from the University of Minnesota. My undergraduate degree was in social psychology at the University. Yes, I was given recognition of an honorary LLD degree from Concordia College in 1972.

Dr. Reece:

Are you a Minnesota native?

Mr. Platou:

I was born in Brooklyn, New York. My parents came from Norway. When the Norwegians immigrated to the United States, many sea-farers stayed in Brooklyn.

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*Mr. Platou is on the Guthrie Theatre, Augsburg College and Farmers and Merchants Bank Board of Directors. He was Knighted by King Olaf V of Norway in 1976.

Photographer: Dr. Farrell Stiegler.

Dr. Reece:

You're known in the medical community as a developer, an innovator, and a man with a nose for opportunity. I'd like to cover some areas in which you've been active. These include development of the concept of hospitals as bank holding companies, the Vinland project, and health planning development in the Twin Cities. In 1972, you wrote an article in the Harvard Business Review on the concept of multi-hospital systems. In that article you said the idea of a hospital as a bank holding company had certain advantages: central administrative support, an enhanced capital base, and a neutrality of ownership that was nonthreatening to trustees and medical staff. Could you tell us more?

Mr. Platou:

Historically, most of the 7,000 hospitals in the United States (the non-profit volunteer hospitals), began with church-ethnic groups. Catholics built hospitals to serve their people. Protestants built hospitals to serve their people. The same is true of private colleges in the United States. Our forefathers had three things on their minds when they came to new communities. One was to establish a church; second was to start colleges; and third was to build hospitals to care for their people. Fairview, for example, was created by a group of Lutheran laymen and pastors to care for immigrant Norwegians.

Today, hospitals founded in the 1880s are still organizationally the same (i.e. Board structure) as they were then. The question we addressed six years ago was: How can we retain the motivations, the community involvement, the Christian concern, and contributions of time and effort of men and women on boards and the medical staff? How can we retain all of that and yet broaden participation from hospital to hospital without infringing on ownership, community pride, and involvement of people, and share commonalities?

The bank holding company legislation in U.S. was put into effect in 1904 so that individual banks with limited capital could join in a pool of a broader capital base to enable local banks to retain merchants and the manufacturers for the economic welfare of the community.

If the banker couldn't do that, local manufacturers would go to larger cities where there were bigger banks with more money. So local community banks were hurting unless they had a means by which they could share common capital.

We felt a bank-holding philosophy would keep in place the local hospital boards, would not disturb the relationships with the medical staffs; and yet offer an umbrella under which all could gather with a sense of independence and yet share all the benefits of that broad umbrella. That's basically what we've been attempting to do.

Dr. Reece:

Has this bank holding concept achieved economies of scale and offered the variety of services and unit stability you envisioned?

Mr. Platou:

In Minnesota some twenty-one hospitals are now involved. Whereas there were two of us nine years ago, and there are now many other hospitals requesting to become involved. We think the proof of anything like this is the desire of others to join, and we have been gratified this has happened. Studies we have been carrying indicate positive cost effectiveness for participating hospitals.

Dr. Reece:

Minnesota, I understand, leads the U.S. in the number of hospital mergers taking place.

Mr. Platou:

I don't know of any state, or any metropolitan area, that has the amount of positive

cooperative activity that we have. The Abbott Northwestern program with Children's and Kenny is superb. The association of Hennepin County General with Metropolitan Medical Center, the United Hospitals in St. Paul are all positive. There isn't any city in the country with as much consolidation and inter-management as we enjoy.

Dr. Reece:

Why Minnesota?

Mr. Platou:

Maybe it's the impact of the University or the Mayo Clinic or the basic characteristic of our people and the honest government. The encouragement to try new ideas is strong here, and we're not as deeply locked as eastern institutions by tradition. There is more innovation here. Ours is a stimulating, intellectual climate.

Dr. Reece:

Part of the manifestation of that, I think, is that Minnesota has more Health Maintenance Organizations for its population than other states, higher percentage of physicians in group practice, and a greater proportion of our beds devoted to such innovative things as alcohol treatment. How do you feel about the number of hospital beds devoted to alcoholic rehabilitation?

Mr. Platou:

Well, the Citizen's League Report says we have too many hospital beds for too many purposes, at least compared to Seattle. Yet people in Seattle look to us as leaders in chemical dependency and in-hospital psychiatric treatment. Statistics are a dangerous weapon to use in comparing utilization rates.

Dr. Reece:

You mentioned the Citizen's League Report. The press published that and recently published two other items. Number one, the fifteen percent inflation rate in the Twin City hospitals over the last year; and number two, an editorial questioning whether a new VA Hospital should be built. Could you comment on each of these reports? After all, the public has a point. Can we afford a fifteen percent annual inflation rate in hospital cost?

Mr. Platou:

The subject of cost is difficult, and I would quote to you from a book of the proceedings from the European Economic Community held a year or so ago in Brussels, Belgium. The Secretary General of Belgium states the health care cost as percent of GNP is 20 percent in Belgium and 12 percent for the rest of the European Economic Community. So our system, which now consumes about 8.5 percent of the GNP, performs better than centralized European systems.

What I'm getting at is this: in the United States, even with our reported imperfections, we're doing better than other nations. From our critics, there is an implication something is terribly wrong here. The problem is not a United States problem; it is a situation of all western societies and the splendid developments in medical science that benefit mankind.

Dr. Reece:

Perhaps another point should be made. Other sectors of the U.S. economy – construction, food, lawyers' fees, magazine and newspaper rates – are going up faster than health care.

Mr. Platou:

Recently, Professor Naftalin had invited me to speak on a question and answer program that he has on Channel Two, and I quoted a September 1977 issue of

Newsweek. *Newsweek* gave these inflation increase figures for the last five years: health care 53 percent, food 57 percent, new automobiles 59 percent, college education 70 percent, new homes 80 percent.

I think the health care inflation issue is primarily a psychological and an emotional one. People do not wish to pay for health care. It's like buying a plot for your burial. You are reluctant to spend money for certain things. You are willing to save for an education for your youngster; you are willing to save for a holiday or for a new home or for an automobile. But, purchasing health care is negative, and there is therefore an antipathy about it. However, in terms of where health care ranks economically and what is happening, its cost is not disproportionate to the rest of our economy.

Incidentally, it's interesting to note health care expenditures in the U.S. compared to other nations. In the Netherlands you would have to work ninety-eight hours a year to pay for total care; Italy a hundred; West Germany, a hundred six; Sweden, a hundred ten; France, a hundred forty-eight; the United States, ninety-four. Another point. In the United States, if you wish to have hernia surgery, the wait is a week or a few weeks. In Britain, it's about 335 days. In the United States if an employee, workman requires hernia repair, a surgery is routinely carried on without any delay. This affects labor and the productivity of our Nation.

Dr. Reece:

Do you think a National Health Insurance Program is inevitable in the U.S.?

Mr. Platou:

Well, I think it's inevitable unless medical organizations and hospital boards don't fully apply themselves and prove to the public that ours is the best system. It's really up to us to prove we are doing the best. That's why there is such an aggressive desire in this metropolitan area and in this state to innovate.

Dr. Reece:

What do you think about the Citizen's League's proposal to close 2,000-4,000 metropolitan hospital beds?

Mr. Platou:

That is being thrashed about, examined and studied thoroughly. That proposal really stems out from HEW who says that we should have fewer number of beds per thousand in the United States.

Dr. Reece:

3.7, they say is ideal, but HEW would like you to get down to 4.0.

Mr. Platou:

The U.S.S.R. has 10.9 beds per thousand.

Dr. Reece:

Just one item about closing down hospital beds. When HEW made its proposal to limit hospital beds, they got 55,000 complaints from citizens around the country so HEW would not close their local hospitals. The hospital industry is now about the third largest in the country and it represents a formidable political constituency. Do you know offhand in the Twin Cities, how big an employer the hospitals are?

Mr. Platou:

Well, as an example, Fairview Community Hospitals has more employees than General Mills. We are the third largest industry in the Twin Cities, the hospitals. I would point out again that in Belgium, the U.S.S.R., and other European countries the number of beds per thousand are much higher than the U.S.A., substantially higher.

Still, the current thinking in the United States is to cut down the hospital beds on the

assumption that there is an overabundance of the use of the hospitals by physicians and the hospitals themselves are encouraging physicians' use. And, if we take beds out of service, we will be able to dampen admission rates.

I have in my hand a magazine called the Association of Governing Boards of Universities and Colleges. There is an article here by the Professor of Economics of the University of Colorado, who is also a trustee of Haverford College in Pennsylvania. He states things here we ought to be alerted to. He says the great danger in all decision making is in concentrating on the things that are easy to find out, but neglecting the things that are hard to find out; and further there is nothing wrong with statistics as long as they are not mistaken for truth. That the worst possible decisions are those which are made under the illusions of certainty. What I'm getting at is that there is an illusion, an assumption, that if we take out a thousand or two thousand beds we are going to drop costs. There is no proof of that. It is perfectly proper to address eliminating beds, but it is important that there not be false impressions given to the public that dropping beds is going to drop costs. Because if beds are taken out of service, we must recognize the consequences. And we do not know what the consequences will be.

Dr. Reece:

Remember the hospital bed shortage in the Twin Cities in the 1950s?

Mr. Platou:

Yes, how times change. In the 1950s the public policy in the United States was to add beds, add hospitals, build and build and build. And then we had the need for the United Hospital Fund Unit in the Twin Cities for building more beds.

Now, if there are no utilization review committees; if there are no PSROs, if there is no rate review by the state for hospitals, if there is not in place a health board which grants Certificates of Need for new programs, new facilities, new equipment; then, we are being unpatriotic or greedy.

Dr. Reece:

When the press announced the 15 percent hospital inflation rate, I noted the press failed to observe hospital utilization rates have dropped 10 percent in the Twin Cities.

Mr. Platou:

That's correct. But inflation rate is only one of the things we should talk about. There's the matter of accessibility, the neighborhood location, the ambulatory care programs, the outpatient programs, in given sectors of the city.

Dr. Reece:

I would agree other factors should be considered. For instance, how do you compute the economic balances of a man who has to wait a week to have his hernia fixed and get back to work with a man who has to wait 355 days to get it fixed and not be able to work for that period of time?

Mr. Platou:

That's productivity, and hospitals are designed to be productive institutions. If we have a health system that is not going to respond to our public's needs as in the case of hernia repair, it's going to adversely affect productivity. This matter of closing beds, taking some beds out of circulation; that is only part of the equation, that's not the total equation.

You must be careful that you don't just take a statistic and say we have "X" too many beds, and assume that taking them out will have a positive result. There are more things hidden in the equation that you better be sure you examine.

Remember, Sputnik 20 years ago and the crisis in the U.S. educational establishment? Well, that crisis blew over. So will this health care crisis. What we

must be careful of is in tinkering with the health delivery system. Closing out a thousand beds is not going to answer any fundamental question. You must be more judicious than that. That's why the dialogue is starting with the health board now, and I say the debate is a good thing.

Dr. Reece:

One of the criticisms of the Carter Administration Cost Containment Bill is it does not include Federal Hospitals nor VA Hospitals. An article appeared in the Minneapolis Star saying that the Minneapolis VA hospital was in the third worst physical condition of any veteran's hospital in the United States, and therefore a thousand bed institution should be built. A Minneapolis Star editorial commented on this and questioned whether it was appropriate to build a new institution without the Metropolitan Health Board's approval. What do you think of the Star's editorial?

Mr. Platou:

I would endorse the concept of that editorial, on the principal that whether it's a federal institution or a state institution or a community institution is not the issue. The issue is the public is paying for health care whether it is through taxes, which supports the VA and the Hennepin County General Hospital or whether it is through Blue-Cross Blue-Shield which are hospital coverages. The public is paying one way or another, and the health board is set up to monitor and advise on behalf of the public at large what should or should not be done. I think that the *Star* is completely correct.

Dr. Reece:

So far in this interview you have defended the present system. But, you've been in the forefront of a new idea, and this is the Vinland Center, which is basically an institution for health promotion. Could you tell us about the background?

Mr. Platou:

The Norwegian parliament in 1976 gave the United States $200,000 to form the Vinland Center. I was invited to organize a Board for the Center. The Vinland Center is a health-sports center patterned after centers now established in Norway, and being built in Sweden, Denmark, and Finland — to change people's life styles to ones of health. The approach is a positive one and motivates people to strive for good health habits, within their physical abilities. The Minnesota center will be restricted to helping handicapped people.

Dr. Reece:

Where would the Vinland Center be built, and who would finance it?

Mr.Platou:

The Minnesota Legislature in the last session appropriated $200,000 for the center. We are now involved in discussion with national groups for funding to build the Vinland National Center somewhere south of Minneapolis-St. Paul. It would be on about one-hundred seventy five acres of land. Its orientation is not a medical model as such; it is a sports health orientation program. To begin with, there will be 60 to a hundred people living there for six week periods of time, who are physically handicapped. We're starting with those in our population who are physically handicapped: blind, and many different types of permanent handicape. We have a close tie with the University of Minnesota. It is felt that lessons and information derived from Vinland will be applicable to the population at large.

Dr. Reece:

So you envision that Vinland Center programs could be extended from the handicapped to the non-handicapped?

Mr. Platou:

Definitely. We've had marvelous encouragement from the State of Minnesota, from Gov. Perpich and Senators Humphrey and Anderson, Congressman Quie has also been deeply involved with this. Also I would mention Vice President Mondale.

Dr. Reece:

The political climate may be right. As you know, the Cooper Institute in Dallas for jogging executives has caught on and this Longevity Institute in California has become the rage. And we have twenty-five million joggers in this country. There is a shift, would you agree, from treating illnesses to health promotion?

Mr. Platou:

Acuity of care has also held the spotlight in the United States, but now we have become sophisticated enough to understand that health has to do with daily living, and that's what has to be restructured to change longevity. It will be slow in coming, but that's what we're about.

Dr. Reece:

Do you have any final comments?

Mr. Platou:

Yes, I do. I would commend the men and women of the medical profession for their contributions to health care, and to public and private hospitals. The time doctors spend in self scrutiny, in reviewing, in evaluating, in self-criticism, is something you do not often find in society. And this is in addition to the time that physicians devote to their practice for their patients. For some reason, the doctor's sacrifice in time and effort for the public good is never fully conveyed to the public, and that should be remedied.

The community is indebted to the men and women who serve voluntarily on hospital boards of trustees and spend a significant amount of time serving on committees on behalf of their Boards.

Cover Photograph
"Tai Chi Chuan"

Dr. Arnold J. Kremen, a Minneapolis surgeon and Associate Editor of MINNESOTA MEDICINE, took the cover picture early in the morning in a park in Peking.

The subject was doing the traditional Chinese exercise TAI CHI CHUAN. This is a common exercise practiced in China. It is a meditative type of exercise, and has been said to be the most widely practiced exercise in the world. One sees people in all the cities in China, early in the morning in every open area, performing this type of exercise. The picture was taken by Dr. Kremen in the course of a tour in China, last October.

Continuing Medical Education

Q and A — CME

The following questions concerning the CME rules of the Minnesota State Board of Medical Examiners are frequently asked. Dr. J. C. Cain, Chairman of the Board's CME Subcommittee, has supplied the answers. If readers have additional questions for Dr. Cain, please send them to *Minnesota Medicine*.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

Questions: I wish to maintain my Minnesota license even though my practice is in another state. What does the Minnesota Board of Medical Examiners require of me to reregister my Minnesota license?

Answer: To maintain a valid Minnesota license to practice medicine in Minnesota, the physician must reregister each year. Physicians possessing a valid license in a state other than Minnesota where that licensing board requires equal or greater CME, may be reregistered in Minnesota by reciprocity. Out of state physicians may also fulfill the Minnesota reregister requirements by submission of the completed and signed form sent by the Board, listing the categories and hours of their CME. Physicians may also satisfy reregistration requirements by submitting to the Board evidence of Specialty Board certification or recertification during the reporting three-year cycle.

Question: I completed my residency in July of this year, but my birthday puts me into the first reporting class (January 1979). How do I report?

Answer: You should certify on the CME-Reregistration form the months of your approved residency training during 1978. Tabulation of CME categories and hours is not required until your next CME reporting period, which would be 1982.

Question: Who must report their CME the first go-around?

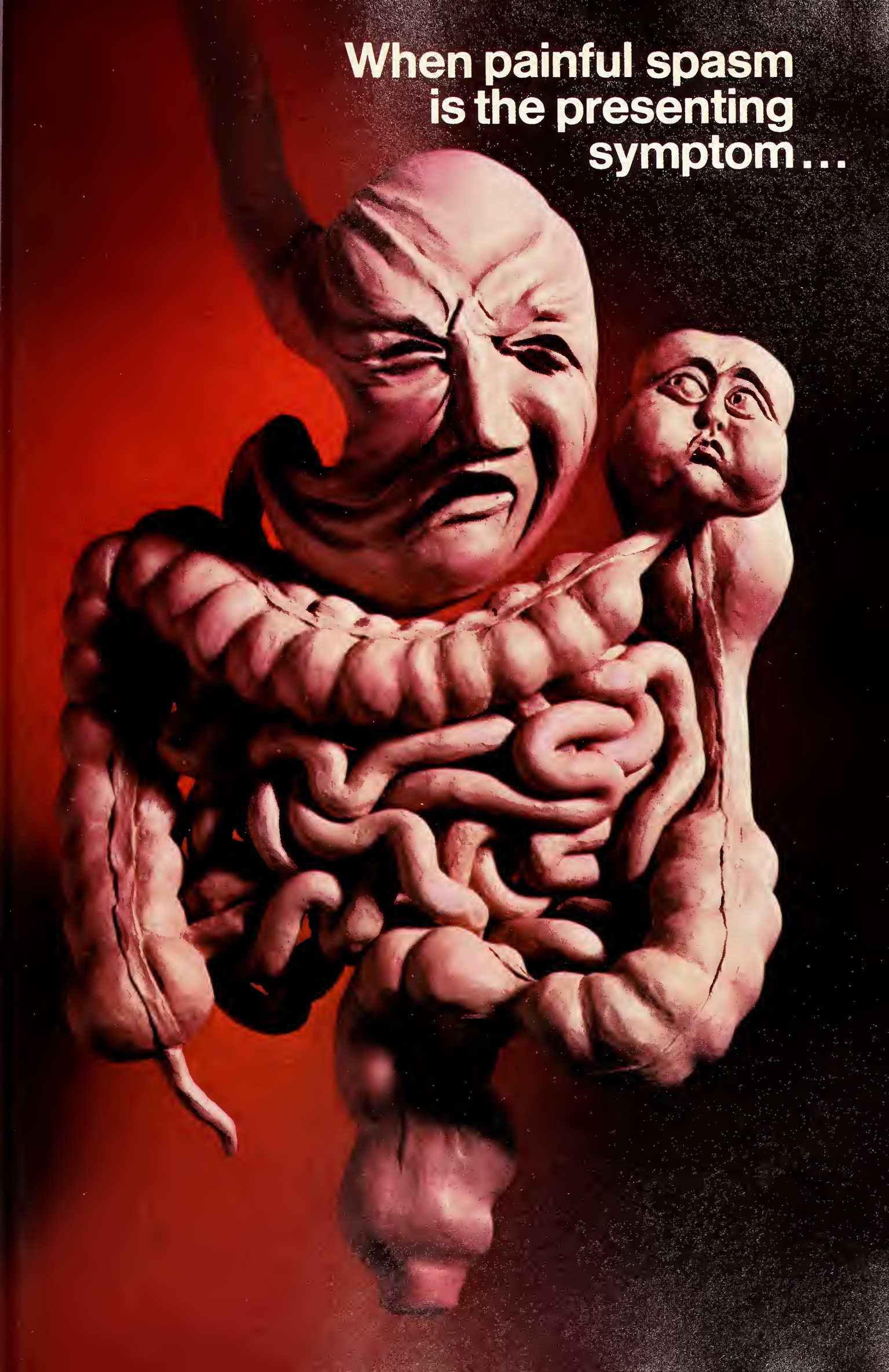
Answer: All Minnesota licensed physicians whose birth dates are included within the dates 1 January-30 April are required to send the Board a categorized report of CME activities in January 1979. This group must report a minimum of 50 hours of documentable CME, at least 20 of which must be in Category I. A form will be sent you indicating that you must report this CME.

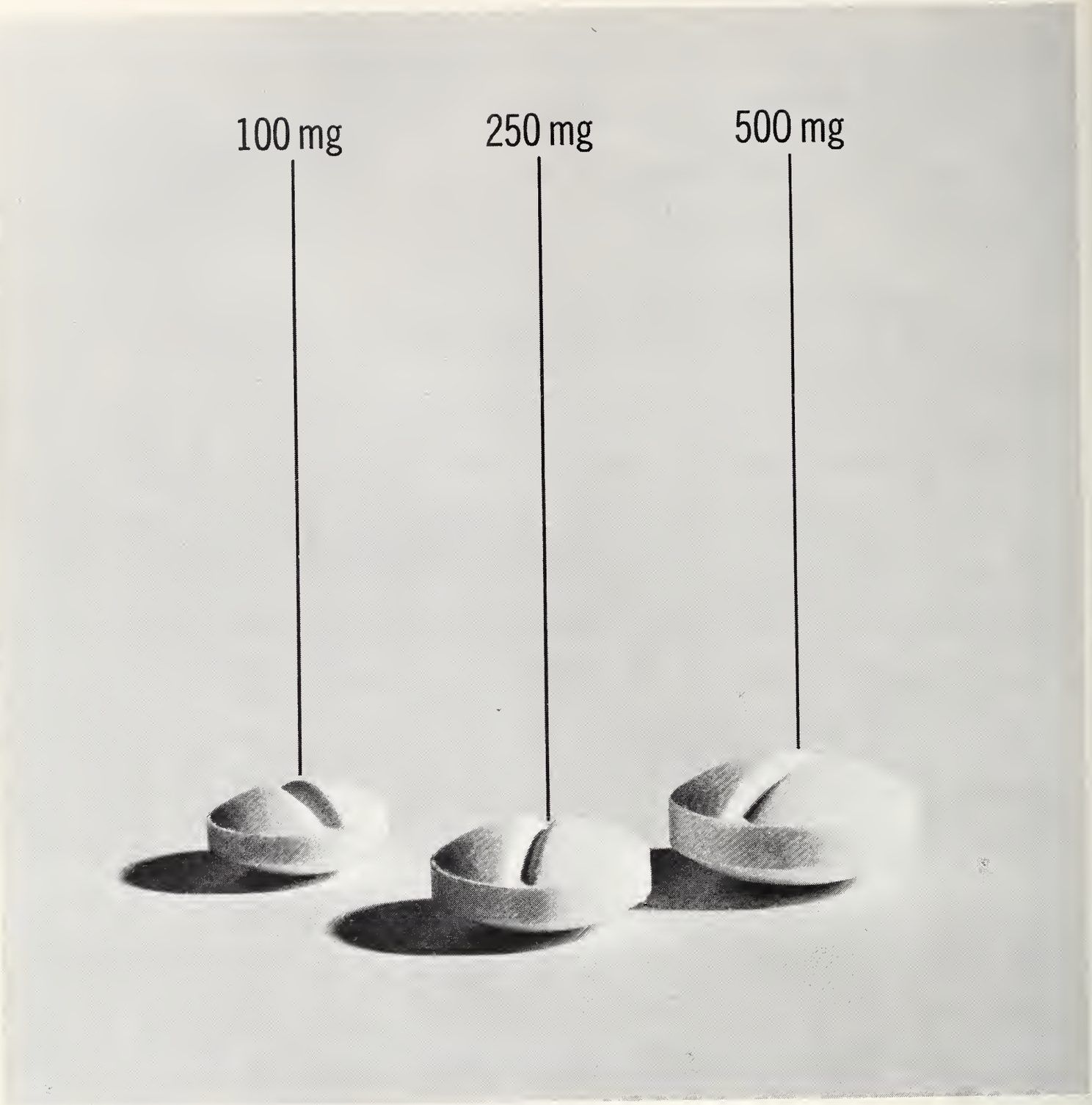
Question: The Minnesota Board of Medical Examiners' Category I is less restrictive than Category I of the AMA-PRA. Can you summarize the Board's Category I requirements?

Answer: The Board may assign *its* Category I rating to educational activities it believes have suitable merit. In addition, the Board has currently assigned Category I status to educational programs or courses sponsored or co-sponsored by organizations (hospitals, medical schools, national societies or boards) approved by the LCCME for continuing medical education. Currently, the programs of certain regularly meeting state specialty groups also meet the definition of the Board's CME Category I.

Question: How does the Board interpret the term "course" as it applies to Category I?

Answer: A "course" is a unit of educational activity usually completing a single subject or objective. Obviously, different course objectives may be achieved by the expending of as little time as one hour or as much as several days.


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ee following page for prescribing information.

Reference:
King, J.C. and Starkman, N.M.: Evaluation of an antispasmodic. Double-blind evaluation to control gastrointestinal spasms occurring during radiographic examination. A preliminary report. Western Med. 5:356-358, 1964.

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THESE FUNCTIDNAL DISDRDERS ARE DFTEN RELIEVED BY VARYING CDMBINATIDNS DF SEDATIVE, REASSURANCE, PHYSICIAN INTEREST, AMELIDRATIDN DF ENVIRDNMENTAL FACTDRS.

For use in the treatment of infant colic (syrup).

Final classification of the less-than-effective indications requires further investigation.

CDNTRAINDICATIONS: Dbstructive uropathy (for example, bladder neck obstruction due to prostatic hypertrophy); obstructive disease of the gastrointestinal tract (as in achalasia, pyloroduodenal stenosis); paralytic ileus, intestinal atony of the elderly or debilitated patient; unstable cardiovascular status in acute hemorrhage; severe ulcerative colitis; toxic megacolon complicating ulcerative colitis; myasthenia gravis. WARNINGS: In the presence of a high environmental temperature, heat prostration can occur with drug use (fever and heat stroke due to decreased sweating). Diarrhea may be an early symptom of incomplete intestinal obstruction, especially in patients with ileostomy or colostomy. In this instance treatment with this drug would be inappropriate and possibly harmful. Bentyl may produce drowsiness or blurred vision. In this event, the patient should be warned not to engage in activities requiring mental alertness such as operating a motor vehicle or other machinery or perform hazardous work while taking this drug. PRECAUTIONS: Although studies have failed to demonstrate adverse effects of dicyclomine hydrochloride in glaucoma or in patients with prostatic hypertrophy, it should be prescribed with caution in patients known to have or suspected of having glaucoma or prostatic hypertrophy. Use with caution in patients with: autonomic neuropathy; hepatic or renal disease; ulcerative colitis–Large doses may suppress intestinal motility to the point of producing a paralytic ileus and the use of this drug may precipitate or aggravate the serious complication of toxic megacolon; hyperthyroidism, coronary heart disease, congestive heart failure, cardiac arrhythmias, and hypertension; hiatal hernia associated with reflux esophagitis since anticholinergic drugs may aggravate this condition.
It should be noted that the use of anticholinergic/antispasmodic drugs in the treatment of gastric ulcer may produce a delay in gastric emptying time and may complicate such therapy (antral stasis). Do not rely on the use of the drug in the presence of complication of biliary tract disease. Investigate any tachycardia before giving anticholinergic (atropine-like) drugs since they may increase the heart rate. With overdosage, a curare-like action may occur. ADVERSE REACTIONS: Anticholinergics/antispasmodics produce certain effects which may be physiologic or toxic depending upon the individual patient's response. The physician must delineate these. Adverse reactions may include xerostomia; urinary hesitancy and retention; blurred vision and tachycardia; palpitations; mydriasis; cycloplegia; increased ocular tension; loss of taste; headache; nervousness; drowsiness; weakness; dizziness; insomnia; nausea; vomiting; impotence; suppression of lactation; constipation; bloated feeling; severe allergic reaction or drug idiosyncrasies including anaphylaxis; urticaria and other dermal manifestations; some degree of mental confusion and/or excitement, especially in elderly persons; and decreased sweating. With the injectable form there may be a temporary sensation of lightheadedness and occasionally local irritation. DDSAGE AND ADMINISTRATION: Dosage must be adjusted to individual patient's needs.
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Product Information as of October, 1976

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Classified Advertisement

(Continued from page 606)

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(Continued on page 634)

History

Surgical Reminiscences

Scenes from Bygone Days

OWEN H. WANGENSTEEN, M.D.*

ON THE OCCASION of his 80th birthday, celebrated by the New York Academy of Medicine in 1930, William Henry Welch said that were he offered a second chance in life to start again, he would decline because, said he, one could not count upon the same good fortune he had enjoyed. To the same question I would reply in the affirmative. I admit freely to having used up considerable luck in the present tenure. In my view, a life spent in the academic arena is one of the most pleasant and rewarding that anyone can have. With complete dedication and industry, and in the company of like minded associates and young colleagues, any person who strives without interruption with all his talents is bound to have a rewarding life and achieve a modicum of success.

Much of what happens to us in life is accident. I was born and raised on a farm in western Minnesota in Becker County in the waning years of the nineteenth century. I had no ambition other than to be a farmer. When I was 13 years of age, my father had 50 Poland China sows that could not farrow their young. The veterinarian advised they be sent to the South St. Paul stockyards. I demurred suggesting that I be granted a chance to see what could be done. Multiple births, as every obstetrician knows, is a time consuming task. I learned that the hand was a far more sensitive and effective tool for the purpose, than the pocket gopher type of snare advertised then in agricultural journals. After a month out of school, I was able to present my father with 300 piglets and 50 living sows. The pigs obviously had some nutritional deficiency which made it impossible for them to farrow their young. After that, my father would hear of nothing other than I should be a doctor. In fact, I spent three years in the academic college of the University of Minnesota before acceding to his wishes in 1917. Help on the farm that summer during World War I was impossible to get. After the hauling of much manure pitched by hand and drawn by horses, when my father again asked me what my intent concerning college was I replied, "father, I will do anything you would have me do." So through the portals of pigs and manure, and a good spread of each, I became a medical student. My first intent was to become an Internist, but before the first lecture by my future surgical preceptor, Arthur Strachauer, on appendicitis, was over in 1920, in my junior year, I had decided upon surgery as a career. I observed that was where the action is. I never had occasion to doubt the validity of that judgment. Our language is in need of an appropriate word to connote transition from rejection to acceptance, a commonplace occurrence for all of us, in which Time and Experience are the primary catalysts.

Surgery Welcomes New Leaders

It was my privilege at the 1959 Dinner meeting of the American College of Surgeons to announce the name of my successor in the office of President. I began by saying he was born in this century, which few words were followed by prolonged and enthusiastic applause, long before I had the opportunity to announce his name. That occurrence served to tell how much the profession looks forward to new leaders. Incidentally, his name was Robert M. Zollinger, an important contributor to surgery's advance. His 1955 paper published together with the late Edwin Ellison of Milwaukee on the Non-Beta Cell Pancreatic Tumor, now known as the Zollinger-Ellison sydrome became a landmark in directing attention of the profession to the gastrin theory of gastric secretion first promulgated by J. S. Edkins of London in 1906. The work of R. A. Gregory of Liverpool derived its incentive primarily from that interesting publication of Zollinger and Ellison.

A Few Notes on the Department's Beginnings

Since its beginnings in 1888 the direction of the University's Department of Surgery was in the hands of part-time capable community surgeons. James E. Moore was the real builder of the Department who accepted a full-time appointment a short time before his death from pernicious anemia in November 1918. Dean Elias Potter Lyon had been imported from St. Louis University by President George Edgar Vincent, who recreated the University in 6 brief years. Moore

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Presented October 29, 1977 at the weekly Saturday Morning Surgical Conference of Faculty and Students.

See editorial, page 583.

cooperated fully with Dean Lyon and President Vincent in establishing a graduate school of medicine within the University and was an active spokesman for the faculty in effecting the Mayo affiliation. His successor was Arthur C. Strachauer, who accepted a half-time appointment, my immediate predecessor and preceptor. By the mid 1920s, Dean Lyon began urging full-time heads for most of the clinical departments. In 1925 Francis Newton, a protege of Harvey Cushing at Harvard was interviewed, and in 1927 Mont Reid came via The Hopkins and the University of Cincinnati for a faculty interview. It was my privilege to escort both during their visits through the surgical wards and laboratories. Both said in effect: "There is nothing here and there never will be." Neither had stayed long enough to sense the friendly atmosphere to learning that Vincent and Lyon brought to the University and its Medical School. It came as a pleasant surprise to me approximately 18 months following my European tour that the University Regents named me Associate Professor and Director of the Department of Surgery January 1, 1930; certainly not because I was the most eligible, but the University apparently was unable to do any better. It obviously was a real challenge for one not yet ready for such an important responsibility.

Mistakes of a Young and Inexperienced Surgical Administrator

The departmental budget was $30,000 in January 1930 when I assumed direction of the department. By July 1931 when I was named full professor, the departmental budget had decreased to $20,000, because of the severity of the financial depression, and decrease in the legislative appropriation. In 1930, we had one surgical fellow. I discussed with the incumbent, Leslie Tasche, now of Sheboygan, Wisconsin, the need to appoint another. He protested there was not enough work for two residents, threatening to quit. In making out the budget for the Department in July 1930, I proposed to Dean Lyon that by withdrawing the stipends from our part-time clinical staff, I could appoint 6 surgical fellows. Dean Lyon reluctantly agreed, feeling the transition should be gradual. No opportunity was taken away from the part-time staff, but over the next few years they spent less time at the University. Approximately three and a half years later, following the budgetary decision of July 1930, and a new Dean, the problem came back to haunt me. Dr. Richard E. Scammon, probably the finest teacher during the School's 90 year period of existence, called me to his office early in May 1933 and handed me a several page typewritten, single-spaced letter to read. I took approximately 5 minutes to peruse it hurriedly and said to the Dean, "This is a lot of trivial drivel." Additionally, I added the interns and residents are my friends as are all the unpaid surgical clinicians. I also became aware that my friend and class-mate, Dr. Halbert Dunn, University Hospital Director, with whom unfortunately I had been a successful candidate in the competition for class standing, apparently was of the opinion that the prior rivalry was continuing. It was patently clear to me that the brilliant Dean, completely inexperienced in administration, had probably in mind another appointee for the position. In replying by letter the next day to the Dean's assessment of the Department under my direction, I said I would step aside until the problem was resolved, sending a copy of my letter to President Coffman, a great leader with a gruff exterior but a sympathetic and understanding heart. Within three weeks I was completely vindicated, receiving the undivided support of Dr. Strachauer, Dean Lyon, President Coffman and Regent Mayo. Dean Scammon was made the University's first distinguished Professor in 1935, relieving him of administrative responsibilities. Dunn took off for Washington, D.C. where he became a very successful statistician in the Bureau of the Census; thus terminated an unhappy but instructive experience for me, fortunately at an early time in my professional career.

During those three weeks of soulful cogitation I dreamt up the manner of proving swallowed air to be the primary source of gaseous distention of the bowel in the presence of intestinal obstruction; and formulated a plan, if vindicated, to spend the remainder of my professional career in trying to build at Minnesota a strong Department of Surgery on the basis of the surgeon's finest paymaster, shared opportunity. In baring my myocardium to you now in this recital, I want to say that this unhappy experience helped me to formulate a Program that worked out well for the Department, the Medical School, the University, and for me. Shortly thereafter, representatives of the University of Illinois in Chicago came twice to persuade me to take over the Direction of its Department of Surgery. I did capitulate to their wishes of a visit. Their faculty's very warm reception of me with prospects of greatly increased earnings was attractive but I realized fully I had fallen heir to a wonderful opportunity at Minnesota when I ill deserved it, and that I must stay on to justify the University's confidence in me. I have had no reason to regret that decision, followed in subsequent years by rejection of similar invitations from other prestigious universities.

Nature of Hospital Population in Surgical Wards in the 1920s

The Elliott Memorial, the first unit of the present University Hospital came into being in 1913. The addition of the Christian, Todd, Eustis, and Health Service wings came about in the 1925-1930 period by which time the ward population of surgery including its specialties, varied from 110 to 130 beds, a figure that now has probably more than doubled.

Exophthalmic goitre was a prevalent surgical disorder. We often had as many as half a dozen such patients on the wards at the same time. Before the innovation of the preoperative administration of Lugol's solution of dilute iodine by Henry Plummer and William Boothby,[2] the graded operative procedure was usual. Injection of boiling water into the thyroid lobe to be removed, initiated by Miles Porter of Ft. Wayne, Indiana in 1915[3] was common practice. If the reaction was great, the first procedure initiated thereafter was ligature of the superior thyroid artery on the side of the projected lobectomy. All this was changed by the suggestion of Plummer, making it possible to perform primary subtotal thyroidectomy for Graves' disease. Today exophthalmic goitre on surgical wards is a rarity, owing primarily probably to the work of the late David Marine[4] who with others helped define the optimal daily requirement of iodine.

As late as 1926, I observed the elder George Crile perform thyroidectomy by stealth for Graves' disease. Patients with this disorder were given an anesthetic gas in several sessions in their beds to a stage of unconsciousness. When the patient's response to this therapy was minimal, subtotal resection was performed with the patient asleep in bed.

Appendicitis

Rupture of the appendix with peritonitis was a frequent observation on the wards 40 to 50 years ago accompanied by a large mortality. In fact, in 1930 appendicitis ranked among the 15 most important causes of death in the United States, some 18,000 patients dying annually of this disorder. Late diagnosis and delayed recourse to surgery, accompanied by the administration of cathartics early in the disorder were contributing causes to rupture and a large mortality. In recent years our population has more than doubled, and despite a 97 percent reduction in mortality, 1200-1400 patients continue to die annually from ruptured appendixes.* We obviously have a long way to go to meet the challenge of Charles N. McBurney[5] one of the original advocates of early operation who said that general acceptance of that precept would terminate mortality from appendicitis.

As a youngster, aged nine, I had the unfortunate experience of being a victim of acute appendicitis. We lived 35 miles away from the nearest hospital in Fargo, North Dakota. My father suggested that perhaps I should take the train to Fargo to be operated upon; however, I knew that two of my schoolmates who had accepted that suggestion had come home in coffins. Our family doctor walked daily nearly a mile through the snow from the village of Lake Park to come to see me at our farm home. He had no suggestions and after several days of observation with no therapeutic suggestion, my father called in the other village doctor. He had some acquaintance with the current medical literature and knew of the conservative management of appendical abscess by A. J. Ochsner of Chicago.[6] I can recall looking out the window and seeing the two doctors pass without speaking. Dr. Winberg urged total abstinence from food and fluid by mouth and a quart of water to be administered by proctoclysis each day; an ice pack was applied day and night over the right lower quadrant. Within a week, I was well on the road to recovery.

Some of you may be unaware that 40 years ago Clarence Dennis and I were able to provide proof of the nature of perforation of the appendix; 50 years ago in 1927, I had heard Ludwig Aschoff of Freiburg say that appendicitis was a specific bacterial disease caused by the streptococcus B of Gundel. Surgical students of the alimentary tract, especially of intestinal obstruction, are inclined to believe that many disorders are essentially mechanical in origin. We began by studying obstruction of that segment of the appendix in the rabbit which, in its terminal portion, approximates in appearance that of the human appendix. It was a wise choice; of 10 rabbits in which the appendix was obstructed at this level by ligature, seven ruptured within 10 hours.

Dennis then operated upon 26 different species of animals from chicken, duck, goose to turkey. With the help of a Commissioner at the St. Paul Como Zoo we were permitted to ligate the cecal appendage in a tiger and a bear without duplicating what we had observed attending obstruction of the rabbit's appendix. The matter of anesthesia offered no problem. Placement of a physiologic dose of phenobarbital in a piece of meat, upon ingestion, produced somnolence in a brief interval, and when the animals were asleep we quickly applied an ether cone.

We worked also with a variety of monkeys, the gibbon, and finally the chimpanzee, before we were

*In 1973 marking a 70% increase in population since 1930, there were only 1066 deaths from appendicitis. The record continues to improve.

able to duplicate in the latter what had been observed in the rabbit. Every segment of the intestinal canal from the stomach through the sigmoid colon is poised either predominantly toward secretion or absorption of fluid. Many had believed that because of attachment of the appendix to the cecum it was an absorptive organ. Every premise needs to be tested by experiment. In the rabbit and the chimpanzee, we had observed high intraluminal pressures approaching systolic blood pressure when the base of the appendix was obstructed. In the rabbit perforation occurred within 10 hours; in the chimpanzee, within 24 hours.

Observations on Man

In the mid 1930s, exteriorization of malignancies of the large bowel prior to excision was commonplace procedure; primary resection for colon cancer came only in the late 1930s. In 15 patients with colon cancer undergoing exteriorization of the lesion, and in whom the appendix appeared normal, we were able to demonstrate that the intraluminal pressure in the exteriorized appendix upon obstruction was very similar to what we had observed in the rabbit and chimpanzee; 24 hours after obstruction intraluminal pressure within the obstructed human appendix regularly exceeded diastolic blood pressure. These were patients largely in their 60s and 70s. No patient came to any harm following the procedure and all survived the procedure, and final restitution of intestinal continuity.

The fecalith is the usual obstructing agent, but the nature and origin of the appendical fecalith continues still a mystery. John Alexander-Williams of Birmingham, England came here to spend a year studying the problem. I advised him also to become interested in other facets of the alimentary canal, including gastric secretion, in which area far more progress had been made, than concentrating solely on trying to resolve the origin of the appendical fecalith.

These observations were published in standard journals, quite widely read.[7,8,9] Yet one finds little or no evidence in currently available surgical texts of this strange behavior of the obstructed appendix.

Empyema

Not all physicians took immediately to the lessons of World War I in the management of empyema. In the fall of 1925, the University of Minnesota acquired a full-time professor of medicine, Hilding Berglund of Sweden, who had come to us directly from the biochemistry laboratory of Otto Folin at Harvard. On a crisp October morning, I noted the professor leaving his house; I stopped to offer him a ride to the hospital in my Model T Ford, introducing myself as the current senior surgical resident. Said the professor, "You are just the person I need to see." He then related a situation which concerned a young student with empyema for whom he had recommended open rib resection, adding "the physicians in the Health Service know nothing of the treatment of empyema and have never heard of Hippocrates, who insisted that wherever pus is present, it must be completely evacuated." It was clear also that the professor was not familiar with Hippocrates' reservation concerning the need for cautious delay in opening the pleural cavity to drain serous pleural purulent collections. What began as a friendly discussion of the surgical management of acute empyema, less than a mile distant from the hospital, had become a controversy of some proportions as we neared the hospital. Scandinavians, addicted to profanity, as many of you in this community are aware, do not swear by Jehovah but by the devil. The new professor obviously proved to be quite a temperamental individual. He had apparently mistaken my name as Wagenstein and obviously had regarded me as ignorant and somewhat imprudent too in departing from Hippocrates' rule relating to management of purulent collections. Said he, Fan kjaere dei, piske og brenne dei, translated meaning, may the devil cut, whip and burn you, colorful language that a Norwegian readily understood. By the time we were within the hospital, I politely suggested to Professor Berglund that he read what Evarts Graham said upon the matter. Mention of the name Graham occasioned the Professor to exclaim loudly, "I now see a dim light on your mental horizon." Thereupon I wrote out two recent references by Graham and handed them to the Professor.

Within the hour, I was visited by our distinguished professor of pharmacology, Arthur D. Hirschfelder who said, "Owen, you must go to the professor at once and apologize." I replied "I find it difficult to do so because I am certain that my stand in the matter is sound." Said my faculty friend, "It makes no difference. You are only beginning to scale the academic ladder. Don't make the mistake of contending with a professor." The matter had also reached the attention of Dean E. P. Lyon, whose appointee I was as well as my teacher, Arthur Strachauer, neither of whom offered any advices in the matter.

All this occurred on a Friday morning. Late the next Tuesday afternoon, while busily washing my hands following some dressing changes on Level I of the old Elliot Memorial Hospital in what is now Ward 12,

Professor Berglund, having just returned from presenting a clinic concerning the patient in question said, "Doctor, those references you gave me were not bad, in fact, not half bad," a rather generous concession for a professor to have made to a young surgical house officer. Thereafter, we became fast friends and often discussed medical-surgical interphase problems.

Following the influenza epidemic of 1918 during World War I, we saw many instances of chronic empyema. Many of these were owing to premature drainage of empyemas with a serous pleural type of exudate inviting complete collapse of the lung on the side of the operative procedure, an occurrence necessitating extensive rib excision, including thickened parietal pleura and intercostal muscle bundles bringing skin on the involved side to the lung surface. To avoid the large abdominal hernias, attending sacrifice of the intercostal muscle bundles and nerves, I devised a method of ribboning the thick pleura, sparing vessels and nerves,[10] a procedure not always completely successful in that it wasn't always possible to spare the blood supply to every intercostal bundle.

The Paris surgeon, Edmond Delorme (1894)[11] had suggested decortication of the visceral pleura over the collapsed lung, a procedure long neglected by thoracic surgeons. In 1932, I was able to report five such instances, in four of which the lung was readily expanded. The ideal is to excise the thumbnail thickened visceral pleura, peeling it off in the manner one detaches the peel of a tangerine orange. If the peel simulates the paring of an apple, bronchial fistulas result, complicating convalescence. Since World War II, this procedure has been revived for empyema following traumatic hematomas. No one has yet satisfactorily explained why in suppurative empyemas the parietal pleura may exceed an inch in thickness, while the visceral pleura overlying the lung is usually less than a millimeter thick.

Perhaps in no sector of the surgeon's activity has there been so great a change as in dealing with infections of the lung. With the advent of antibiotics, pneumonia has virtually disappeared, and consequently empyema is seen usually only as a complication of traumatic hemothorax. Bronchiectasis too has mysteriously become virtually nonexistent probably because of the disappearance of whooping cough and other childhood infectious diseases.

Bowel Obstruction

Many of you have some familiarity with the expenditure of effort by a large number of associates and myself upon bowel obstruction, extending over more than 50 years from 1925 well beyond my superannuation more than 10 years ago.

Victor Bonney, gynecologist and abdominal surgeon to the London Middlesex Hospital, had championed performance of high jejunostomy for peritonitic states.[12] His surgical colleague, W. Sampson Handley[13] was partial to enterocolostomy for the same disorder. The inversion enterostomy of Stamm[14] and Kader[15] widely in use in the mid 1920s invariably left the patient with a fistula needing secondary closure. The Bonney operation had many adherents in the St. Cloud-Little Falls area of Minnesota, patients later seen with a drooling fistula, attended by skin maceration, on our surgical wards. That is how my career as an abdominal surgeon got underway.

Many years ago I remarked that surgeons could be divided into two categories: those who see what they believe and those who believe what they see. As late as 1930, feculent vomiting had been identified with colic obstruction. Until elective abdominal surgery was born in the last quarter of the nineteenth century, physicians were in charge of patients with ills of the large body cavities, the abdomen and thorax. Often composing new texts with 3 or 4 older books before them, and not being able to distinguish fact from fiction, these physician authors of the late nineteenth century copied bits of each into their new creations. In 1929, I observed a patient with huge intestinal distention without vomiting. He proved to have a cancer of the sigmoid. Within a few years I had seen similar instances of acute colic obstruction without vomiting, or regurgitation only of a gastric or bilious fluid; and meanwhile too a large number of patients with acute small bowel obstruction with feculent vomiting had been observed. By 1934[16] I was ready to say that feculent vomitus was definitely identified only with obstruction of the small bowel, identifying me with the surgical group who believe what they see.

No one in this clinic in the mid 1920s had any interest in the bowel obstruction problem; the field was mine. I promptly introduced the Witzel technique of enterostomy, using a small French Nélaton catheter number 14 rather than the number 30 rectal tube of Witzel. When the catheter was withdrawn in a week, a month or even later, a fistula never followed. This was the beginning of the reduction of the formidable 65 percent mortality of acute intestinal obstruction reported by C. Jeff Miller of the New Orleans Charity Hospital in 1929.[17] With the introduction of gastroduodenal suction siphonage in 1932 the mortality continued to decline. Horace Scott and I[18] noted the greatly increased density of the bowel in canine

experiments attending venous occlusion to segments of the jejunoileum; an observation that John Perry[19] in our laboratory converted to practical use by the addition of pneumoperitoneum. On roentgen films, the infarcted loops looked like they were barium filled, a very useful test in the early recognition of strangulating obstruction attending venous occlusion.

The remaining barrier to be overcome is timely recognition of mesenteric arterial occlusion. Ghanem and Goodale[20] showed the way, utilizing Harlan Root's technique of assessment of the leucocyte count in the peritoneal fluid; invariably at eight hours after occlusion of segments of the superior mesenteric artery in laboratory animals high level counts, far exceeding that in the peripheral blood, were regularly observed. Similar clinical assessments should now be made in several clinics. In surgical clinics professing a serious interest in management of acute bowel obstruction the current mortality is probably in the 5 to 8 percent range. Edlich and Leonard[21] using peroral intubation for decompression followed by operation were able to report a mortality of 1.3 percent among 73 patients with acute obstruction of the small intestine when the bowel was viable, reviewed by the present author.[22] In the few patients with non-viable bowel, the mortality was 25 percent. Prompt application of the Root-Ghanem-Goodale principle in the recognition of mesenteric arterial obstruction should also effect considerable reduction in the mortality of this threatening and hazardous component of the bowel obstruction problem.

Management of Cellulitic Infections

Prior to the arrival of sulfanilamide and penicillin there was no effective treatment for cellulitic infections. In the late 1920s our professor of ophthalmology, William Murray, sustained a prick of his left thumb during performance of mastoidectomy. Dr. Strachauer amputated the arm, a procedure that failed to overcome the cellulitic process. Shortly thereafter, Lucretia Wilder, a graduate student in anatomy while working with a streptococcal culture spilled a drop on her forearm; the rabbit she was about to inject intravenously scratched the spot and within a few days she was dead.

Forty years ago sulfanilamide became available and proved very effective in the control of streptococcal cellulitic infections. Prior thereto, the activity of the surgeon was essentially delimited to evacuation of abscesses. When he tried to do more, he usually did harm. Some of my surgical teachers returning from World War I were imbued with the idea that implantation of an antiseptic into infected wounds would stop its ravages, following out Lister's thesis of 1867 for which purpose he used carbolic acid. Carrell and Dakin in World War I employed a hypochlorite, which agent Semmelweis at the Vienna Allgemeines Krankenhaus (1847) had employed very effectively as prophylaxis against puerperal fever in parturients more than 6 decades earlier. Miss J. S., aged 23, a young teacher in a rural Minnesota one room school, was admitted to our University Hospitals in January 1934 with a septic phlegmon from a compound fracture of the left femur and great swelling of both thigh and leg resulting from an explosion in the wood-burning stove attending ignition of the wood with a fluid from a can believed to contain kerosine. A lid of the stove struck her left thigh with great force causing a compound fracture of the femur. An immediate adequate debridement of the open wound was done but the cellulitic process accompanied by high fever still persisted. An experienced World War I surgeon of our clinical staff then urged multiple incisions in the thigh and leg. Believing that drainage could not halt the cellulitic process, I persuaded him to undertake the procedure, which he willingly carried out in two operative sessions. Continuous irrigation of the resultant wounds with the Carrel-Dakin technique had not the slightest restraining influence upon the infection, accompanied by hectic picket-fence fever. A senior orthopedic surgeon, also with World War I experience, then counselled amputation at the hip joint, which advice the patient rejected. This surgeon, with the assistance of Melville Manson, senior surgical resident and John Paine then applied a double leg spica plaster cast extending from the toes to the axillary folds. The patient had previously been in an overhead Balkan frame with traction applied to a Kirschner wire through the lower end of the femur. Putting gentle pressure on the bed invariably caused her great pain. After encasement in the plaster, the patient could be turned from side to side without the slightest evidence of discomfort. Its effect upon pain, fever, and the general course of the patient was immediate and dramatic, the patient making a satisfactory recovery from what appeared to have been a hopeless situation.* It is for similar cellulitic streptococcal infections that sulfonamides and antibiotics have had such a significant impact, but unavailable in this area until a few years later. This plaster cast mode of management was then employed regularly by this surgeon and helpful

*Meanwhile the patient had been lost to follow-up; however, that great sleuth in finding missing persons, Dr. Victor Gilbertsen, located her within an hour after the patient's chart was placed in his hands, after the Departments of Social Service and Records had abandoned the chase. She came to see me in September 1977 after Labor Day, and apart from arthritic pains in the right "normal hip" she has no complaints.

colleagues over many years for many acute extremity infections, combined with elevation of the limb well above heart level, to reduce swelling, and usually with favorable responses.[23,24,25]

Alteration of Surgeon's Activity Through Medical Gains

Hematogenous osteomyelitis was frequently observed in teen-age children prior to availability of sulfanilamide. It also commanded considerable morbidity and a modest mortality, accompanied by chronic osteomyelitis with sequestra in survivors. A common debate in those days was whether a gimlet opening of the diaphysis near the epiphysis was as effective as extensive longitudinal opening of the bone. I favored the first mentioned operative procedure. Since appearance of the sulfonamides and penicillin, this disorder too has become a rarity.

When I was a junior intern at the Gillette Children's Hospital in St. Paul in 1921, one-third of all hospital admissions were for tuberculous cervical lymph nodes and tuberculosis of bones and joints. Two decades later, there were none. The work of the Live-Stock Sanitary Board, mandating pasteurization of marketed milk and the slaughter of cattle reacting positively to a tuberculin test, gradually (1910-1935) eliminated bovine tuberculosis. Isolation of human carriers and discovery of streptomycin (1944) and ancillary therapeutic drugs added significantly to overcoming the threat of pulmonary tuberculosis, the foremost cause of death in our country in 1900.

The crippling deformities of poliomyelitis engaged the activity of the orthopedic surgeon over several decades. It came under control in the 1953-1963 decade through the brilliant work of Enders and his Harvard associates (1949) and the immunization programs of Sabin (1955) and Salk (1953). In consequence, the absorbing corrective activity of the orthopedic surgeon with this scourge has been done away with.

19th Century Discoveries That Accelerated Surgery's Advance

Anesthesia was a great victory for surgery and surgeons that came about through the Boston dentists Horace Wells* (nitrous oxide 1844), and William Morton (ether 1846), Crawford Long of Jefferson, Georgia had used ether successfully for operations since March 1842; unfortunately he failed to publish until 1849. Prophylactic surgical antisepsis was born in the hands of the Hungarian obstetrician Ignacz Semmelweis (1847, 1861), who established its effectiveness in the prevention of puerperal fever. All opposition to his thesis had collapsed in German speaking Europe by 1867, when Lister's first publication upon instillation of phenol into wounds of compound fracture first appeared in print. It is remarkable that these two important therapeutic innovations emerged from two Cinderellas of the profession, dentistry and obstetrics. The pathogenicity of bacteria was firmly established by Koch in 1876-78 creating the science of microbiology, medicine's finest therapeutic innovation. Radiography, medicine's greatest diagnostic tool came through the physicist, Konrad Roentgen (1895).

*Dr. Fred Van Bergen (1976) reminded me that Wells' contribution of nitrous oxide has proved the more durable contribution, ether and chloroform having disappeared from current usage.

Intracardiac Surgery

The most important contribution of surgery to medicine's advance in the twentieth century has been development of intracardiac surgery. It all began with John H. Gibbon, Jr. of Philadelphia. He and his wife, a medical technician, were working on the problem in the surgical laboratories of E. D. Churchill at Massachusetts General Hospital. With the help of engineers, Gibbon assembled a large electrically driven machine which would serve as oxygenator attending ligature of the pulmonary artery. I have heard Mrs. Gibbon tell this story; it is a fascinating tale. By the end of World War II when men began returning from the far flung islands of the Pacific as well as from Italy, France, and Germany, we acquired at Minnesota a rather large contingent of surgical house officers, many of whom returned after years of military service, complemented by others who came here for the first time. Prior to World War II, support for our many Surgical Fellows came essentially from local affluent patients and their friends from whom this surgeon had exacted no professional fees, a practice that paid off handsomely for the Department in the support of young, talented men. The largesse of Uncle Sam, after termination of World War II had a striking effect upon the medical scene throughout America rivaled only by what happened in France and especially in Germany during the last 4 decades of the nineteenth century.

When my good friend and colleague, Maurice B. Visscher returned to Minnesota in 1936 as our professor of physiology, we began holding weekly surgical-physiology seminars in this very hospital lecture room (Todd Amphitheatre) to discuss the physiology of challenging surgical problems. The practice bore usurious dividends in two sectors; 1) the first concerned use of Alfred Nier's mass spectrograph

to determine quickly the concentration of inhaled anesthetic gases. It was common practice in the late 1940s and early 1950s for the anesthetist to give several anesthetic gases simultaneously, not knowing the concentration within the bronchial tract of any of them. The large mass spectrograph, which Nier provided served to inform the anesthetist at once of the concentration of each gas administered and solved the problem, proving a great boon to anesthesia. The work was carried our primarily by Fletcher Miller and Richard Varco of this Department.

Visscher was one of Ernest Starling's last pupils at the University College in London, one of the foremost general physiologists of this century, who had worked with the heart-lung preparation. Shortly after termination of World War II appreciating fully the importance of Gibbon's demonstration of 1939, I became convinced that the surest approach to solution of the challenge of intracardiac surgery lay in training young, talented surgeons in the physiologic intricacies of the circulation. Visscher obviously was the person to undertake the task. He willingly consented. Thus it happened that a large number of our surgical trainees went to Visscher for one to three years to become knowledgeable in problems of the circulation. His influence upon persons like Clarence Dennis, Richard Varco, C. Walton Lillehei, Alvin Merendino, Chris Barnard, Lloyd MacLean, Vincent Gott, and several others was profound. Lillehei emerged as the Leader of this great band. I was only the water-boy and side-line cheerleader. Interestingly, neither F. John Lewis nor Norman Shumway, great contributors to the advance of intracardiac surgery, were exposed to Visscher and his staff only in our physiology-surgery conferences. Their basic training had been in pathology and anatomy. Lewis did the first successful dry heart operation on man for repair of an interatrial septal defect in a youngster, September 2, 1952. Norman Shumway was the first to address himself seriously to the problems of cardiac transplantation, though Chris Barnard preceded him in undertaking the operation on man. Shumway and Barnard were both here in the Department of Surgery at the same period in time in the mid 1950s. Norman Shumway's record with cardiac transplantation is extraordinary for transplantation of an unpaired organ. Of patients surviving three months after the transplant, 73 percent are alive after 1 year; 42 percent after two years; and 35 percent after three years, an impressive accomplishment with a challenging disorder not responsive to any other mode of therapy.

For centuries the management of heart disease had been solely in the hands of the physician. The achievement of surgeons with cardiac disorders during my professorial tenure has been astounding. It all began with successful ligature followed later by division of the patent ductus in the hands of Robert Gross at Children's Hospital in Boston, followed in turn by an operation for coarctation of the aorta, achieved almost simultaneously in the hands of Clarence Crafoord of Stockholm and Gross of Boston. Release of the heart from the thickened pericardium in constrictive pericarditis had been suggested by the same Edmond Delorme of Paris who advocated decortication of the visceral pleura to permit expansion of the lung in chronic empyema, in the last decade of the nineteenth century. However, the procedure did not actually take on until the German surgeons Victor Schmieden and Ludwig Rehn of Frankfurt undertook the operation in the early 1920s. Churchill of Boston pioneered the operation in this country in 1929. I did the first operations for the disorder in Minnesota in the mid 1930s and also for patent ductus arteriosus in the mid 1940s. That was about as close as I came to being a cardiac surgeon.

Visit to Foreign Surgical Clinics 1927-1928

Up until Hitler demolished the influence of universities in Germany in the mid 1930s, many Americans flocked to leading German-speaking medical centers to listen to some of Europe's great teachers. It was, for me, in the 1927-28 era, a great experience. Dr. W. J. Mayo, distinguished Regent of the University of Minnesota, volunteered to write a number of letters of introduction to foreign surgical dignitaries, an invitation which I accepted with alacrity. His letters were an open sesame to the high and mighty in the surgical field everywhere, far more helpful, I am certain, than would have been a letter from the State Department. I elected to go to Bern, Switzerland, under the tutelage of Fritz de Quervain where Theodor Kocher had presided over the destinies of surgery for 45 years (1872-1917) and with Leon Asher at the Physiological Institute. Asher, a pupil of Hugo Kronecker, with whom Cushing had worked, proudly displayed the bottles that Harvey Cushing had employed a quarter of a century earlier in his studies of cerebral compression upon rabbits. In a paper of 1906, Cushing stated that the few semesters spent abroad in physiological laboratories [with Hugo Kronecker at Bern and with Charles Sherrington at Liverpool] had proved more helpful in his future surgical work than the six years spent as house officer at The Hopkins, a

significant confession from one of America's great surgeons.[26]

Welch, known to all of you, was the first Dean and Professor of Pathology at Johns Hopkins. He made two trips abroad prior to taking up his duties at The Hopkins, one of two years in length in 1876-78 and an additional year in 1884-85. His thesis was that moving about from one important laboratory to another, talking with the professors and leaders in research was better than settling down in a given laboratory. And for the experienced investigator, it undoubtedly is, but for the learner anxious to acquire the technique of a Master, several months in his laboratory is time well spent.

A foreign study trip in the 1920s provided an unusual opportunity to hear some of the finest lecturers in medicine and surgery in Europe. The demonstrations of Leon Asher at the Physiological Institute were, in fact, a great triumph. He believed that well prepared demonstrations constituted a better technique of teaching physiology than for students to engage in setting up the various types of apparatus themselves, which procedures he believed should be reserved primarily for graduate students.

The German professor in that day derived a very modest emolument through a university salary, and also partly from student fees. A few surgeons, like de Quervain in Bern, after giving the morning lecture of one and a half hours duration entered into an operation for a few minutes then took off for his private clinic across the city; actually a practice that perpetuated the part-time idea that dominated clinical teaching through most of America until the early 1930s.

I came to have great admiration for many German speaking, extremely knowledgeable professors. It worried me very much, however, to observe how much time some professors of surgery devoted to private practice, a privilege certainly, and not a useful university function when overdone, contributing little to the intellectual stature of the professor. I vowed then that if an opportunity came to me to supervise a surgical clinic, I would attempt to set a good example for my colleagues and trainees, adhering strictly to the primary functions of the university professor.

Cretin Goitre

Shortly after my arrival in late September 1927, Professor de Quervain assigned me the task of studying the vascular system of the Cretin goitre. Such thyroid disorders were frequent in the mountainous area of Bern. With the cooperation of Carl Wegelin, professor of pathology and great student of goitre, I was permitted to make injections of the superior and inferior thyroid arteries on a number of cretins dying in the various clinics of the Inselspital. A number of studies were also made on cretin goitres removed at surgery. de Quervain insisted I should prepare and stain the slides of my microtome sections, and photograph the specimens and slides for publication, the usual procedure for those preparing for the Habilitationsschrift (Inaugural thesis). To hurry things prior to departure in March, I was able to persuade Wegelin's technician for a small fee to make the photographs for me. When I showed the results of the study and a preliminary draft of the paper to the Professor, he approved of all but the photographs. He said you must do these yourself. I protested, pleading inexperience and saying that an experienced photographer could do it much better. Replied the Professor, tonight we will do it together. At 11 p.m. the Professor came to his office and by 4 a.m. the pictures were finished, to which procedure, I was essentially an observer. Moreover, he was on hand for his 8 a.m. lecture.

Surgical Teaching

The range and depth of information of some of the German professors was truly astounding. Many of the impressive teachers knew the history of their discipline well, often providing evidence thereof in their lectures. Erich Lexer at Freiburg was a splendid scholar. He was an eye-witness to the Morell Mackenzie-Ernst v. Bergmann controversy over the management of the German Crown Prince Frederick in 1887 that ended so tragically and with international repercussions. Lexer told that exciting and instructive story in such a manner, it could not be forgotten. Ludwig Aschoff in pathology, Hans Eppinger in medicine, and Wilhelm v. Möllendorf in anatomy, distinguished lecturers, also added great distinction to the Freiburg faculty.

The professor of surgery whom I came to admire most was Eugen Enderlen of Heidelberg. A superb surgeon, lucid teacher and talented investigator who worked daily in his surgical laboratory with whom discussions of surgical problems were facilitated by an easy and comfortable informality, a relationship not readily achieved with all German professors.

Throughout German-speaking Europe, the professors lectured to a large body of undergraduates, usually five times a week, lectures attended also by the hospital residents of that discipline. Contact between student and professor was quite remote. Clerkships at that period in time did not exist in the German-speaking universities, the sole direct contact between professor

and student being in the large lecture amphitheatre; two students were conventionally assigned to examine a patient, and were then interrogated by the professor.

The best clinical teaching to small groups of students was to be seen in British surgical wards and in the outpatient clinic where the teacher, an experienced clinician spent an hour or two and occasionally longer with a small group of hospital clerks, the forerunner of our own scheme which Osler introduced at The Hopkins in the last decade of the nineteenth century. Full-time clinical teachers at that period in time were distinctly infrequent in England, a scene that has changed very much there as it has in this country also, the clinical part-time professor having been largely replaced by the geographic full-time professor.

With the very large student body in most medical schools today, bedside teaching constitutes a difficult and challenging problem; at most only seven or eight students can be accommodated on a clinical ward-walk, optimally six is a more convenient number. Minnesota has 250 students in each of its medical classes. How could they possibly be accommodated in bedside teaching exercises? I have an alternate suggestion. Small teaching units strategically located throughout the hospital floors and wards providing seats for as many as 25 students would provide some semblance of bedside teaching with opportunities for give and take exchanges between students and teacher on all hospital floors. Intimate opportunity for exchanges in the classroom between students and their teacher will enhance the learning experience and promote the policy of the professor of the Open Door.

Before embarking upon the European visit in 1927, I had spent considerable time in the experimental laboratory and came to appreciate the significance of that type of exposure to promote operative skills. During my Wanderjahr abroad, I visited clinics in Denmark, Switzerland, France, Italy, Germany, Austria, Holland and Britain; I was appalled by the lack of interest in the experimental approach to surgery. Only in two areas were surgical laboratories for the training of surgeons in evidence: at the University of Heidelberg under Eugen Enderlen and at the University of Edinburgh supervised by David P. D. Wilkie. For preparation of a specific paper in other schools, somewhere in the medical school complex, most often in the laboratory of the pathologist, an area could be found where experiments could be conducted. In the majority of the clinics however, the research was essentially clinical and did not often involve animals. The great emphasis attached to training in physiology for the clinician by my University of Minnesota physician mentor, the late George Fahr, persuaded me that physiology was an important stepping stone for the surgeon, as anatomy had been through the nineteenth century.

American Board of Surgery

In 1937, the American Board of Surgery came about through the influence of Evarts Graham, an occurrence that served to upgrade community surgery. The emphasis of the Board is upon *doing* operations, neglecting the important item of *observation,* upon which several great surgeons at the turn of the century were reared including the Mayos, A. J. Ochsner, Crile and many others, an occurrence not all for the good.

The Surgical Forum

Sensing that trainees emerging from surgical training programs had no ready access to a platform for presentation of their researches, I editorialized the need for a surgical forum.[27] Evarts Graham, then Chairman of the Regents of the American College of Surgeons invited me to present the plea before that distinguished group. The request was rejected on the basis that such a forum would have no appeal for the membership. Graham then invited me to readdress the Board of Regents at the Fall meeting of the Clinical Congress. This time, I urged *trial* rather than *argument* to settle the matter. Reluctantly the Regents agreed. The 1941 pre-World War II Fall session in Boston was a great success serving to reenlist the interest of professors of surgery in the programs of the Clinical Congress, thus bringing the College renewed life. The annual Forum presentations continue to alert surgeons to new trends in surgery's development and advance.

Student-Teacher Interrelationships

In our schools much time is devoted by Curricular Committees to examination of student performance with no similar evaluation of teacher performance. In my view, this situation represents an inappropriate placement of emphasis. I am convinced that if teacher performance were upgraded student performance also would be better. There is only one way to find out, by trial, certainly not by argument. When fires of enthusiasm for study are incited in their students by teachers, only then is the learning process well served. The story told by Ralph Waldo Emerson of his futile efforts of getting a calf into the barn is very pertinent. Pushing accomplished nothing, but when the Emerson maid noted the proceedings, came out and put her finger into the calf's mouth he went eagerly into the barn.

For 20 centuries and more medical students, on graduation, have sworn allegiance to the Hippocratic Oath acknowledging obligation to their teachers. I proposed recently that a Teacher's Oath be pronounced by a senior member of each university medical faculty at the beginning of each new Fall session, declaring the faculty's intent to accept teaching as one of its chief medical school functions.[28] That suggestion unleashed a veritable flood of unsurfaced agreement and appraisal from distinguished medical educators. I incline to the belief that some classical scholar, sharing similar views, will presently come forward with a durable Teacher's Oath, stressing the obligations of teachers to students. Meanwhile, on the urging of a few responsible medical educators, I have addressed myself to the task of a preliminary draft of such a proposal. May I read to you my version of a Teacher's Oath:

Fellow Students:

Aesculapius, timeless physician of all ages and nations, we beseech you instill in this faculty's teachers a fervent desire to become spirited and effective preceptors of all our student progeny. Your teachers do recognize, appreciate, and solemnly declare to place the enviable privilege as teacher near the top of other demanding priorities: care for patients, and research to improve our fellowman's lot. May we, by example and precept, awaken in each of you an eagerness to excel in all aspects of your accepted trusts. May all of us come to know the abundant rewards of shared opportunity, the finest of paymasters. May greed for money never cross the threshold of our minds. May each of us through prudent and thrifty living come to know the satisfaction and contentment of sharing our bounty with good causes and especially with institutions of learning that created for us the priceless opportunity of spending our lives in the service of our fellowmen and women. With complete dedication and unremitting industry, some of you may come to stand with your work and discoveries before the courts of posterity and eternity. Fellow students, let us build together a friendly and quickened reciprocal student-teacher relationship that would have found acceptance in the eyes of our beloved Hippocrates.

Summary

These scenes from the past will serve to indicate how much surgery has advanced over the past five decades and how the population of university hospital surgical wards has changed during those years. And what might we look forward to in the next 50 years? Many university surgical clinics are employing the Research Center Approach to the transplantation problem. Before the turn of the century, I believe we can look forward to a more definitive solution of the rejection phenomenon. We shall, no doubt, by then also have access to more effective antibacterial agents than now. Prior to World War II, the surgeon used probably less than 10 pharmaceutical agents in his work. Today, he has to be somewhat of a clinical pharmacologist in his struggle to keep abreast of new therapeutic suggestions. With each passing year better anesthetic agents become available that provide important aid to the craft of surgery. Surgery has advanced greatly over the past three decades, a forward thrust that will undoubtedly accelerate as the next century approaches. Surgery will continue to be one of the most fascinating outlets for the medical graduate looking forward to an interesting and rewarding career. The bold entry and successes of the surgeon in meeting the challenges of intracardiac surgery and organ transplantation suggest that before the dawn of the twenty-first century, the surgeon will become an increasingly active participant in devising solutions to baffling enigmas that have long defied understanding. The October 1977 Nobel Laureate Awards to three American scientists, working with somewhat different techniques in hormonal neuroendocrinology has lent renewed emphasis to the challenge of endocrinology for scientists and clinicians. The work of the Laureates recently cited, Rosalyn Yalow, Roger Guillemin and Andrew Schally has improved diagnostic accuracy in obscure conditions and provided previously undreamt of new modes of treatment.

If I were fortunate enough to have a second chance in life at another professional career, I would become a student and surgeon of the alimentary canal with a strong background of training in biochemistry and endocrinology of the gastrointestinal canal. Recent neuroendocrinological studies of brain and mucosa of the gastrointestinal tract have opened up new promising vistas for investigators and clinicians.

Acknowledgment

This Study received support from the Ralph and Marian Falk, the Margaret W. Harmon and the Alice M. O'Brien Surgical Research Funds.

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4-28. Will be found on page 603.

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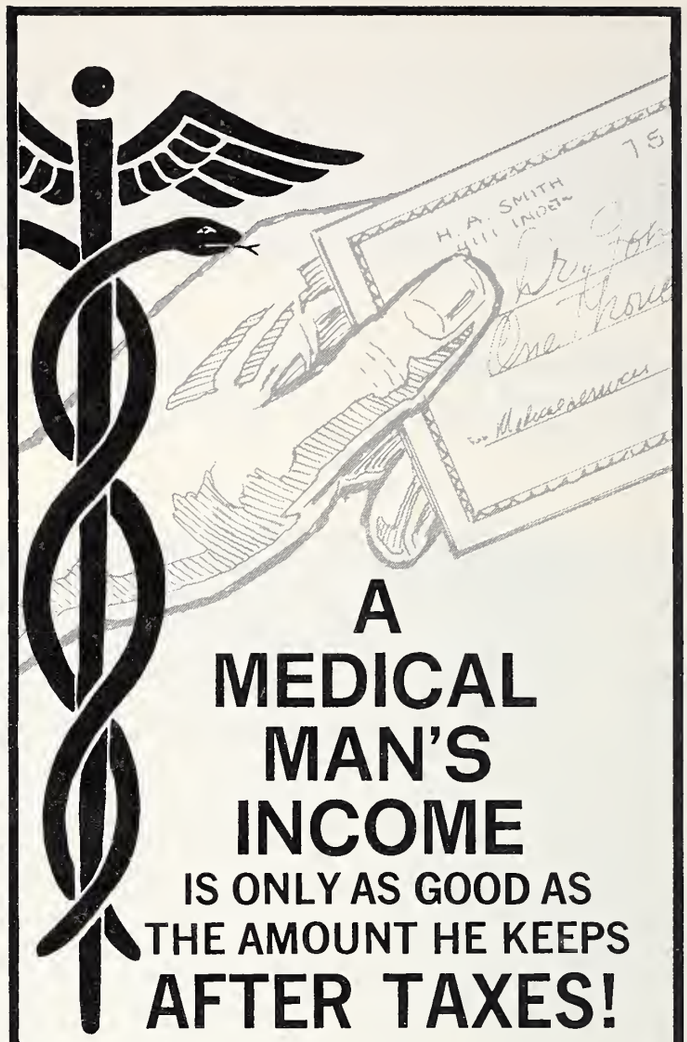
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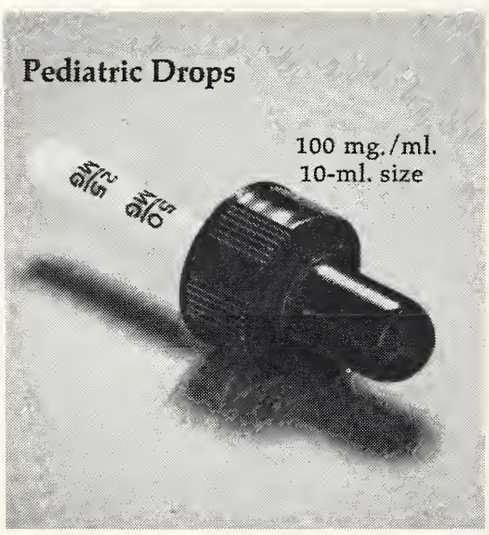
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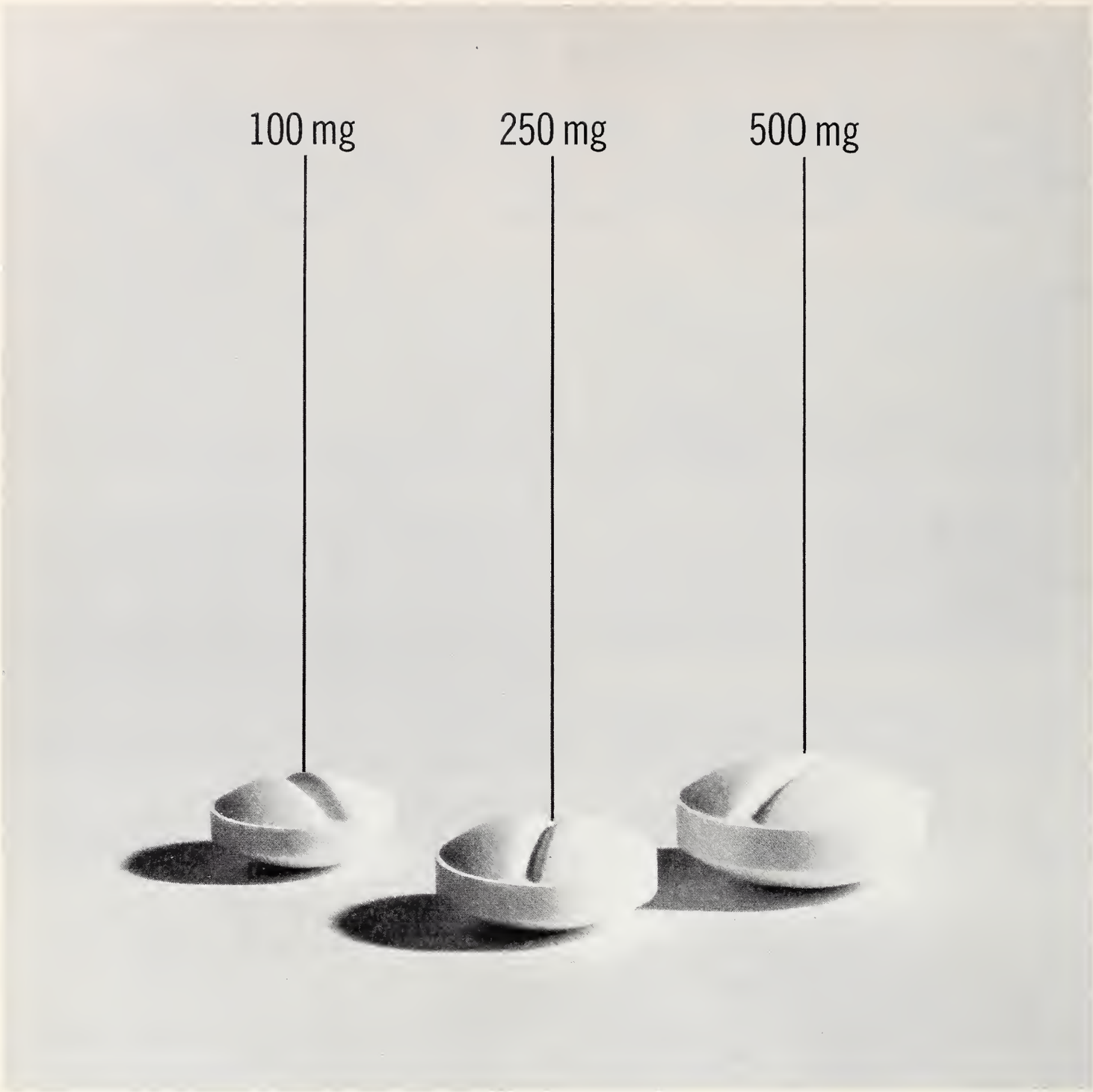
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monthly	12	$7.50 members 12.00 non members 14.00 foreign & Canada

4. LOCATION OF KNOWN OFFICE OF PUBLICATION *(Street, City, County, State and ZIP Code) (Not printers)*
101 E. 5th St., St. Paul, Ramsey, Minnesota 55101

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President's Letter

Salesmanship

The medical profession today is engaged in a mighty struggle for approval of its principles and method of operation. The competition for the approval of that nebulous quality known as public opinion. At stake now, as it has been for many years, is whether or not the medical care system shall be changed and, probably more important, is who shall control it. Our critics are plentiful both outside and within the profession. Our response must be reasonable and consistent with the best possible achievement of preventing disease and alleviating human suffering and disease.

Recently a prominent U.S. Senator was in our state campaigning for some of our candidates who the polls showed needed some help. While here, he couldn't resist getting in some shots at the AMA to a college group when he by innuendo accused the AMA of dealing with the wrong departments of government which he stated to these young people was evidence that physicians were interested only in the economics of medicine. He sounded like a desperate man attempting to discredit the medical profession, but then I suppose he does have a number of more bridges to cross in order to achieve his brand of national health insurance. The news disseminators can hardly mention medical care costs without using the adjectives "skyrocketing" or "soaring."

We, too, are concerned about the rising costs, but when put into perspective with other costs over a similar period of time they are not all that much out of line. It is hard for me to understand, for example, why more than thirty years ago when I had my appendix out by a small town general practitioner, the fee was 60% of what I charge today as an urban, boarded specialist in surgery. And at that time it cost me 3c to mail a letter, and 5c for a newspaper, 15c for a Sunday paper. I recently paid $1.00 for a Sunday paper that was decrying the skyrocketing costs of medical care. News disseminators, who have religiously guarded the constitutional freedom of the press, but mixed it with a little show biz, have utilized the dog bites man theory for so long that less sensational update on progress has become the news which the public really wants to be informed about.

Inappropriate as it sometimes seems, we all must individually and collectively become a salesman for our points of view. Most physicians would feel uncomfortable proselytizing their patients, but certainly ought to be able to discuss with their patients the decisions which society may make as it affects their care in the future as well as in future generations. Collectively, too, we can tell our story in better fashion even though we have seen some progress in that regard. Some physicians have seemed to capitalize on their golden pens in a sort of an expose' from within, but we will perhaps see some new medical authors whose contributions can be more positive. Salesmanship has become yet another necessity for the medical profession.

Robert S. Flom

Robert S. Flom, M.D.
President
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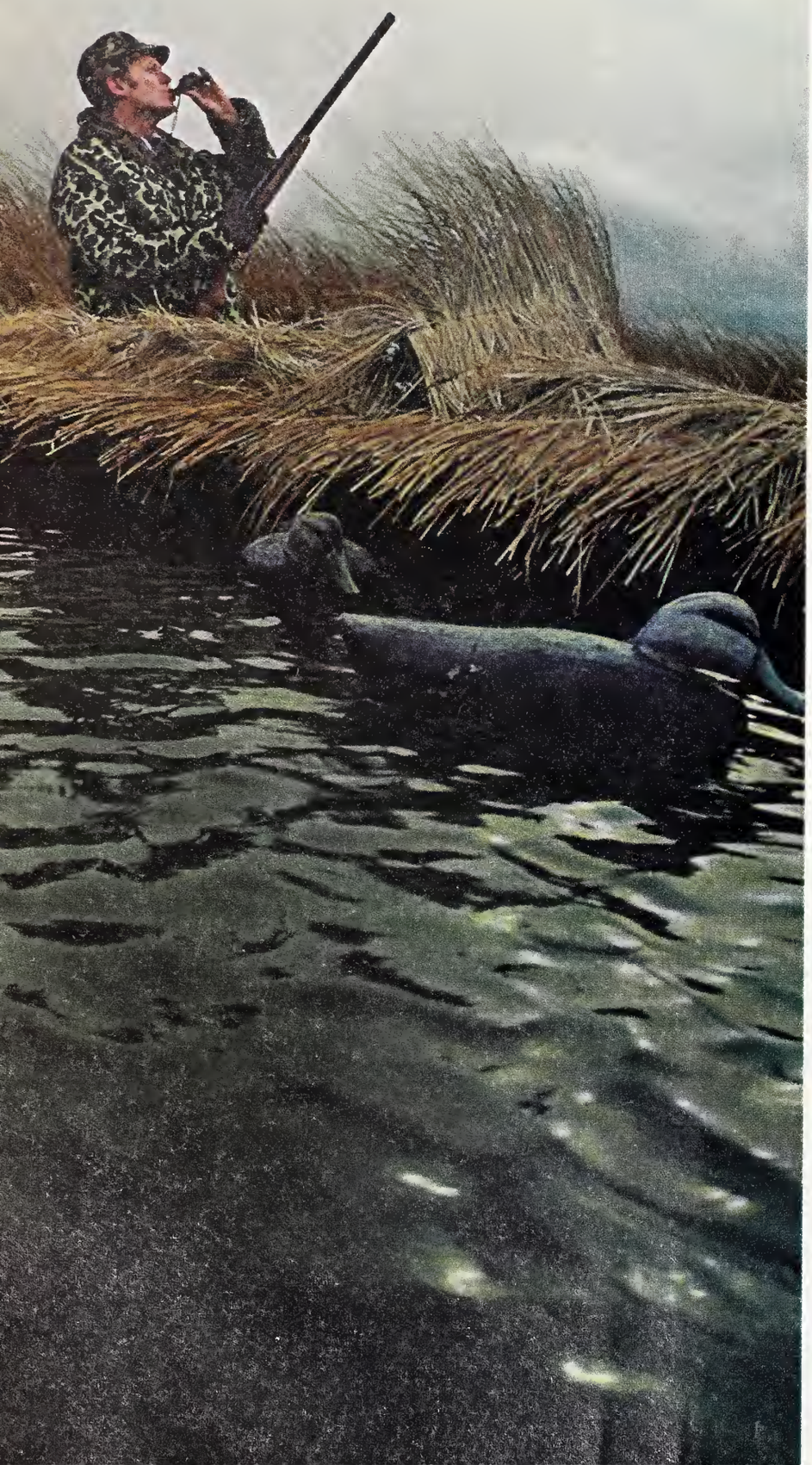
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Arthrography of the Temporomandibular Joint

in Patients with the TMJ Pain-Dysfunction Syndrome

CLYDE H. WILKES, D.D.S., M.D.*

Internal structural and functional changes of the temporomandibular joint have been observed indirectly with an arthrographic technique and directly at surgery in patients with clinical manifestations of the TMJ pain-dysfunction syndrome. The principal internal derangement found was anterior displacement of the articular disc. The fundamental pathophysiological mechanism responsible for production of symptoms concerns the competency of the posterior articular disc attachment.

ALTHOUGH A CONSIDERABLE amount of information has been available on the subject of the temporomandibular joint pain-dysfunction syndrome over the past 50-60 years, it seems that the true nature of this disorder, with respect to its pathogenesis, is still not known. The divergence of viewpoints expressed in the literature, some of which appear to be mutually exclusive, support this contention. It has not been possible to categorize the syndrome with arthropathies of known etiology. The fundamental problem is that the anatomical site or source of pathological change and related functional disturbances, which result in expression of the syndrome, have not been identified in a sufficiently valid manner.

The diagnosis rests almost entirely on clinical assessment. Radiological evaluation of the joint in such cases, or laboratory analysis, has not been revealing. The general views as expressed in the literature, especially over the last 20-30 years, are that the syndrome does not represent a true arthropathy, but rather is a reflection of dysfunction of the muscles of mastication, or malocclusion, or emotional disturbances or various combinations of these latter factors[3,12,20-22,24-26,35,37-42,48]. On the other hand, there have been some considerations made that the disorder does represent, completely or in part, an arthropathy with probable involvement of internal structures.[7,17,18,45,46]

Norgaard in 1944 introduced opaque arthrography of the temporomandibular joint as a method that might allow indirect assessment.[28,29] Since then, a number of investigators have used the procedure.[1,7,8,16,47] The technique has been reported to be quite difficult to perform. Apparently the procedure has not been sufficiently successful or reliable to gain acceptance either as a study method or useful clinical procedure. Little, if any, insight has been gained with respect to probable mechanisms of the pain-dysfunction syndrome.

It is evident that arthrography of the TMJ could be an extremely important tool in evaluating internal structures of the joint as well as functional changes provided technical problems could be overcome and the procedure carried out in a physiological manner.

The purpose of this report is to present experiences with arthrography of the temporomandibular joint particularly in patients with the pain-dysfunction syndrome. Principally, tomographic arthrography was utilized for indirect examination together with routine clinical assessment. Direct observations were also made in a number of cases during the course of surgical treatment. It was possible to correlate arthrographic interpretations and operative findings.

TMJ Pain-Dysfunction Syndrome

The syndrome has been well described by numerous clinicians.[2,5,6,11,15,17,21,26,27,34,38-42] It seems to occur more frequently in young females. Signs and symptoms include various joint noises such as clicking, snapping or sometimes grating. Other symptoms include the sensation of transient or momentary "catching or locking" during various mandibular movements. In some cases patients report a sustained open or closed "lock". Physically, these latter symptoms are thought to correspond to subluxations or dislocations of the condyle head. Pain in and about the affected joint together with limitation of lower jaw motion can be variable, episodic or sometimes continually present. Usually mandibular

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deviation to the affected side during an opening movement is a prominent sign. Schwartz, in extensive clinical studies, established that usually pain symptoms accompanied the limitation state and further that the symptom complex of pain-limitation tended to be episodic.[38–41] Moreover, the joint noises disappeared during the limitation state. Schwartz referred to various joint noises and other signs of subluxation as the incoordination phase. The pain-limitation phase was thought to alternate with the latter. It was assumed that incoordination signs were produced by disharmony in the action of the two heads of the lateral pterygoid muscle with subsequent incoordination of the meniscus and condyle. Muscle tenderness particularly of the lateral pterygoid has also been shown to be a prominent sign of the syndrome.

Case Material

The observations reported here are based on examination and treatment of 400 cases of various temporomandibular joint disorders. Arthrographic analysis of the TMJ was carried out in nearly all patients. Bilateral TMJ arthrograms were carried out in many instances, particularly in early cases as they were consecutively encountered. The latter studies were of significant value. This provided a method of control in interpretation of the films. Further, some insight was gained about details of "normal" joint structures and function. Although there may be some question about compensatory changes expected in the contralateral "normal" or asymptomatic joint, it should be noted that for all practical purposes, most of the joints studied appeared to behave in a physiological manner; and as will be shown later, they were clearly different from the affected joints both from the standpoint of structure and function.

Some patients were treated by surgical measures. This provided a valuable opportunity to confirm, modify or reject the original arthrographic interpretations. Most of the arthrograms illustrated in this report were taken from patients who exhibited the pain-dysfunction syndrome in a very characteristic manner. Several of the cases illustrated were from patients with facial pain disorders unrelated to the temporomandibular joint. One other case was used to demonstrate minor joint dysfunction.

Anatomical and Physiological Considerations

The structure of the temporomandibular joint has been well described.[9,10,13,14,19,23,30–33,36,43,44] There are, however, a number of details that lack clear delineation or are controversial, particularly the dynamic structural relationship of the condyle head, meniscus and articular eminence. These latter relations are of critical significance. The relative importance of the superior head of the lateral pterygoid or other mechanisms that may be involved in articular disc translation is also not well understood. Yet, this too is of critical significance.

The meniscus is a complicated fibrocartilagenous structure which almost completely encapsulates the condyle head. The meniscus together with its anterior, medial, lateral and posterior attachments separates the joint space into two compartments. Figure 1(A,B) is an illustration in both sagittal and frontal views of the usual shape of the meniscus and its intrajoint relations for the closed or centric occlusion position. As shown in Figure 1(A), anterior and posterior recesses exist for both superior and inferior compartments. Lateral and medial recesses of considerable depth also exist for the superior compartment (Figure 1(B). Synovial tissue is present in all recesses, but particularly abundant in the posterior recesses of both superior and inferior compartments. The superior surface outline of the articular disc as seen sagittally represents a smooth sigmoid shaped curve for adaptation to the roof of the glenoid fossa and articular eminence. The posterior or trailing edge of the interarticular disc and the anterior edge are invariably thickened. Usually, the posterior edge is slightly thicker than the leading edge. The posterior attachment of the meniscus consists of fibro-vascular connective tissue with laminar elastic and collagenous tissue components.[9,10,36] The superior lamina of the posterior attachment exhibits abundant elastic fibers.[10] It provides the attachment for the posterior edge of the disc to the post-glenoid

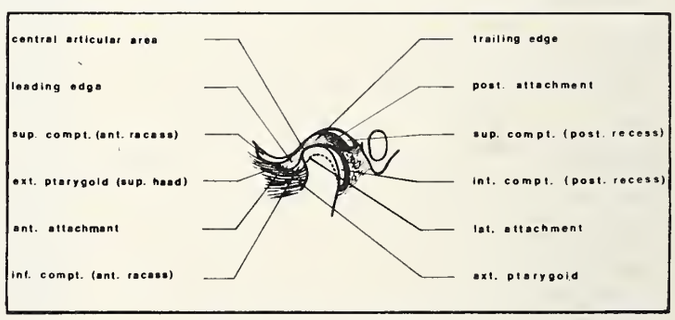


Fig. 1 (A) — sagittal view.

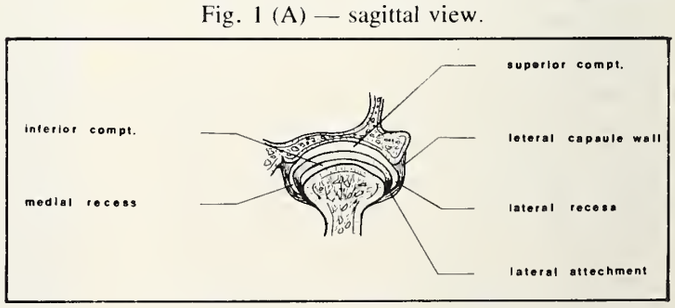


Fig. 1 (B) — frontal section.

tubercle area and the squamotympanic fissure. The superior surface outline of the posterior attachment, as seen sagittally, has a partial sigmoidal shape. Part of the curvature is created by the posterior recess or sulcus of the superior compartment which can be quite variable in its depth. The inferior portion or strata of the posterior attachment consists of inelastic collagenous tissue. This provides the attachment from the disc to the posterior aspect of the condyle neck. The inter-lamina zone of the posterior attachment exhibits much vascularity and is well innervated.[9,10,36] The central articulating area of the disc is quite thin compared to the anterior and posterior edges. Figure 2 illustrates the internal joint structures in more realistic detail. The joint has been distracted in this view.

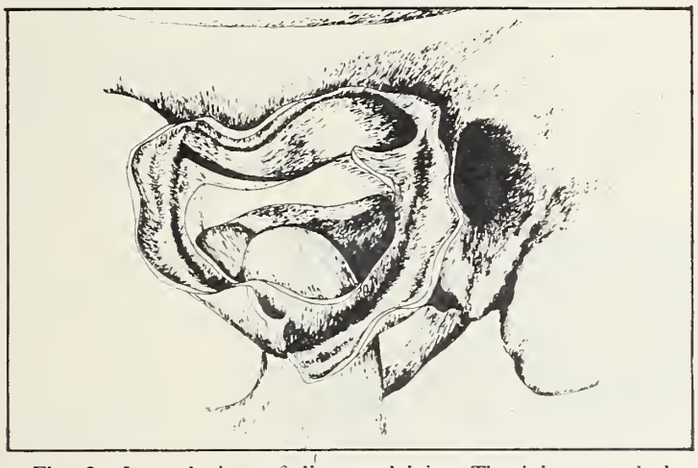


Fig. 2—Lateral view of distracted joint. The joint capsule has been partially resected.

The principal function of the joint consists of translatory and rotary movement of the condyle head with respect to the articular eminence. In the opening movement the condyle head progresses from its seated position in the glenoid fossa to a point at or beyond the articular eminence. It has been generally assumed that most of the translatory movement of the joint occurs in the upper joint space between the disc and articular eminence, whereas rotary movement only occurs in the lower joint space.

It is difficult to ascertain the exact nature of disc movement. At least a portion or all of the superior head of the lateral pterygoid is attached to the anterior or medial-anterior edge of the disc, and an elastic connective tissue structure (superior lamina of posterior attachment) is attached from the posterior edge of the disc to the posterior aspect of the glenoid fossa.[4,9,10,36] This elastic posterior attachment provides *resistance* to forward active and/or passive disc movement and apparently aids or is responsible for *recoil* of the disc during posterior condyle movement. The elastic function of the posterior attachment can be easily demonstrated passively at surgery. However, it has not been possible to determine the degree or significance of active forward disc movement by the lateral pterygoid. Probably both active and passive factors are involved in forward movement. The latter passive mechanism may well involve sheer forces generated by the condyle head on the thickened anterior edge of the disc. The inferior or inelastic lamina of the posterior attachment is at least partially responsible for the position of the posterior edge of the disc with respect to the condyle head, particularly at the final return position. This part of the posterior attachment may also aid in passive return of the disc.

In a simple view the disc can be thought of as a movable fibrocartilaginous socket with active and perhaps passive forward movement and purely passive return movement. It represents a unique and very complex physiological system with respect to joints.

Arthrographic Technique

The procedure essentially consists of cannulating both upper and lower compartments of the joint under fluoroscopic control followed by differential infusion with contrast media.* Because of the anatomical nature of the joint, namely overlapping of joint spaces, it has been found that a tomographic technique provides the best diagnostic quality films.

The procedure is carried out with local anesthesia. Infiltration in the subcutaneous tissue of the preauricular area and superficially over the joint capsule is usually sufficient. Sterile technique is maintained. The patient is instructed to open approximately half-way. Generally the upper compartment is cannulated first with a 20 gauge venocatheter.† This is accomplished by inserting the needle into the roof of the glenoid fossa at about the beginning slope of the articular eminence. A small amount (less than .3 to .4 cc) of local anesthetic is slowly injected as the inner needle is withdrawn and the cannula advanced. The patient is asked to close. This results in seating of the condyle head and a return of fluid will occur. A syringe with attached stopcock, connectors and tubing filled with contrast media is now attached to the cannula hub in a bubble-free manner. A similar technique is used for the lower compartment. Generally the lower space is best cannulated by inserting the needle at the posterior-superior aspect of the condyle head and then advancing the cannual medially and transversely across the posterior surface. Differential infusion is now carried out and tomographic films taken for various condyle head or mouth opening positions.

*Renografin 60, Squibb and Sons, E.R., P.O. Box 4000, Princeton, N.J. 08540.
†Abbocath-T, Abbott Laboratories, North Chicago, Ill. 60064.

There is little question that the technique, principally the cannulations, is difficult to accomplish because of the small anatomical spaces present and the need for near exact placement of the cannulae. With experience and patience, however, it is possible to reduce the overall procedure to a routine out-patient study lasting no more than 30 to 45 minutes.

The adjustment of fluid volumes during the procedure, and avoiding extravasation, particularly as a consequence of functional movements, are critically important factors in obtaining optimal quality films. This is the reason why cannulation is necessary rather than simply injecting by needle.

Fortunately, complications have been extremely rare. A parotiditis developed in one case several days after the procedure which may or may not have been related. In another early case a cannula tip was lost due to improper technique. Otherwise, there have been no other complications in the entire series over a three and a half year period.

Observations

A normal tomographic arthrogram of the temporomandibular joint is shown in Figure 3. The illustration depicts a sequence of tomographic films which correspond to graded condyle head movements. The upper sequence shows that only the lower compartment of the joint has been filled with contrast media. In the lower sequence, both joint spaces have been filled with dye.

Fortunately, normal TMJ arthrograms are quite distinctive with little or only minor variation depending on anatomical form and the degree of condyle head movement. Figure 4 illustrates an interpretation with respect to the functional and anatomical characteristics of the normal joint. Another normal arthrographic sequence is shown in Figure 5.

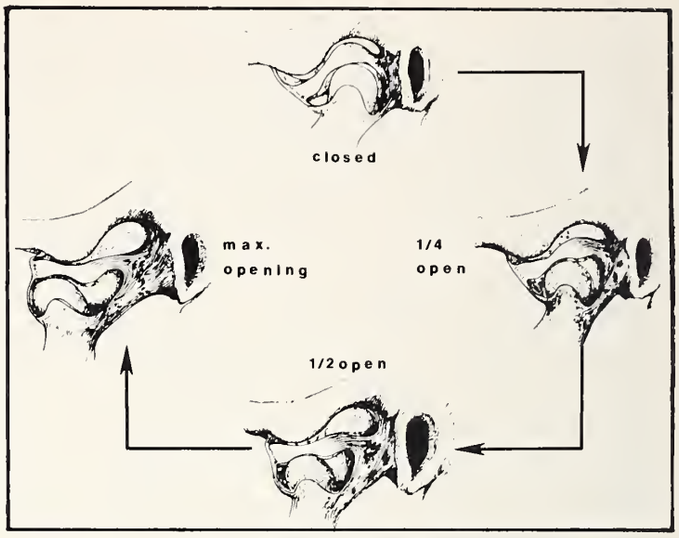


Fig. 4—Sketch of normal condyle head movement.

The most prominent features of the normal arthrogram concern the changes in shape of the joint spaces which correspond to movement of disc, condyle head and the various disc attachments. As shown in Figure 3, the slightly thickened posterior edge of the disc is easily discernible with forward condyle head movement as a concavity in the superior edge of the trailing envelope of contrast material from the lower compartment (the posterior edge is designated by an arrow at maximum forward position of the condyle head in the upper sequence of Figure 3). It should be noted that the condyle head translates almost completely into the anterior recess of the lower compartment. At the one-half open and full open positions there is very little dye anterior to the condyle head

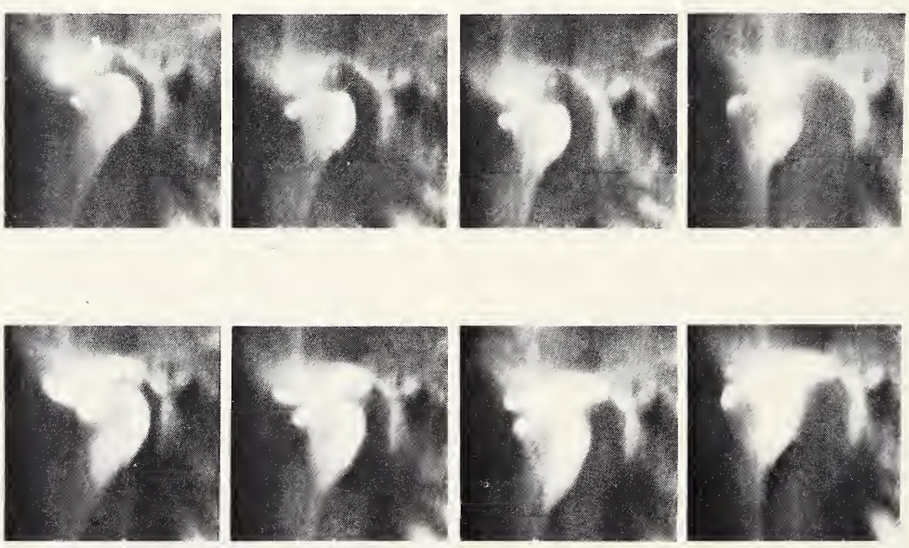


Fig. 3— Tomographic arthrograms of normal joint. Opening sequence, left to right — closed, ¼ open, ½ open, maximum opening. Upper sequence — lower compartment filled with contrast media. Lower sequence — both upper and lower joint spaces infused with contrast media. Arrows designate posterior edge of disc.

except for a small semilunar projection around the condyle head from the lower compartment and a small anterior projection from the upper compartment. As shown in the arthrograms, most of the contrast material flows from anterior to posterior recess of both compartments during translation. The overall form of the articular disc can be discerned from the outline provided by the dye filled spaces. It is apparent that the condyle head when seated in the closed position is located just at the posterior edge of the disc (posterior edge designated by arrow in first frame of Figure 3). As forward translation-rotation proceeds the anterior-superior, followed by the superior and finally posterior-superior aspects of the condyle head articulate with the thin central area of the disc which in turn articulates with the articular eminence. It is also apparent that the elastic posterior attachment of the disc, which at rest is sigmoidal shaped, is under increasing tension during translation as it assumes a more straight line form.

Incoordination of the condyle head and articular disc is a prominent clinical manifestation of TMJ dysfunction. This can be observed arthrographically as shown in Figures 6 and 7. (The latter arthrograms and others that follow are illustrated in a similar fashion as shown in Figure 3; i.e. sequential graded mouth opening positions. The maximum opening position refers to voluntary maximum opening which may or may not be limited.) The first arthrographic sequence, Figure 6, demonstrates an early opening palpable and audible click or snap which occurred between the closed and one-quarter open mouth positions. The arthrographic sequence is near normal for the remainder of the translation after the incoordination point. But, if the closed position films are viewed closely. it can be seen that the entire disc is displaced slightly forward of the condyle head. The posterior edge of the disc provides a slight indentation or concavity in the dye filled anterior recess of the lower compartment (as shown by the arrow in Figure 6). It is apparent that the condyle head



Fig. 5—Normal arthrographic opening sequence.

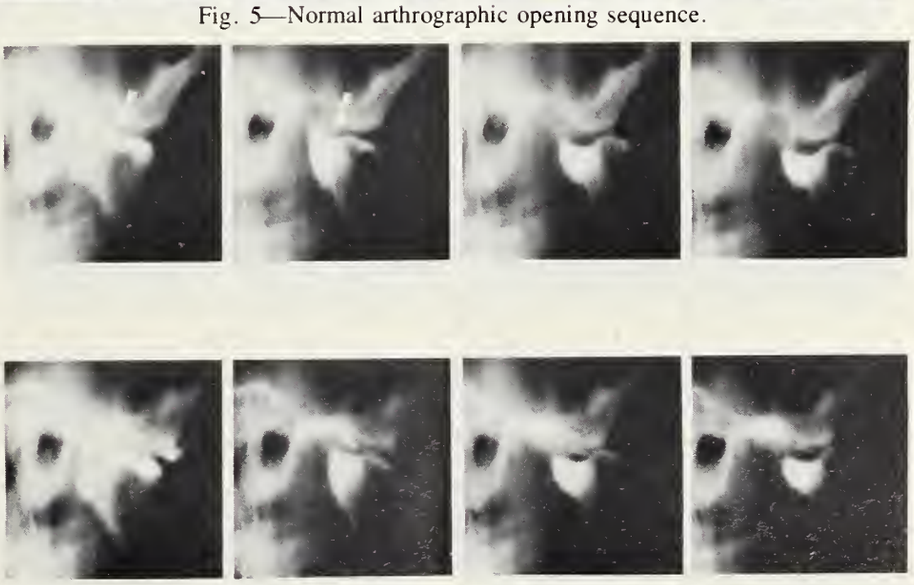


Fig. 6—Arthrographic opening sequence which demonstrates early incoordination. Arrows designate posterior edge of disc.

clears the posterior edge almost immediately during the forward movement. This case is an example of the commonly encountered patient with a "clicking" temporomandibular joint who is otherwise asymptomatic. The case represents minor TMJ dysfunction and is of little clinical significance, except for those cases which show progression later. Figure 7 demonstrates more obvious functional and structural changes. The closed position frames show clearly an anterior displacement of the disc with the posterior edge prominently displayed anterior to the condyle head (designated by arrows in Figure 7). In the upper sequence it can be seen that the condyle head simply pushes or carries the posterior edge of the disc forward. There were no palpable or audible joint sounds in this sequence. A significant amount of contrast media remains anterior to the condyle head throughout the translation. Note that a trailing envelope of dye from the lower compartment is absent. The lower sequence in Figure 7 (carried out a few minutes later), with contrast media in both superior and inferior compartments is fairly similar for most of the movement. A discreet, loud, audible snap occurred *late* in the opening sequence, between the ½ open position and the terminal full-open position. The sudden change in shape of the contrast filled spaces concurrent with the point of incoordination is obvious. Contrast material is now absent from anterior recesses of the upper and lower compartments. A trailing envelope of dye is present in the lower joint space. The concavity in the superior outline of the trailing envelope denotes the posterior edge of the disc (shown by an arrow in last frame of lower sequence of Figure 7). There is little limitation of condyle head movement following the "snap" as shown in the lower sequence. The upper sequence, on the other hand, demonstrates more limitation and is an example of the commonly described clinical situation of "closed lock". The degree and nature of the folding of the anteriorly

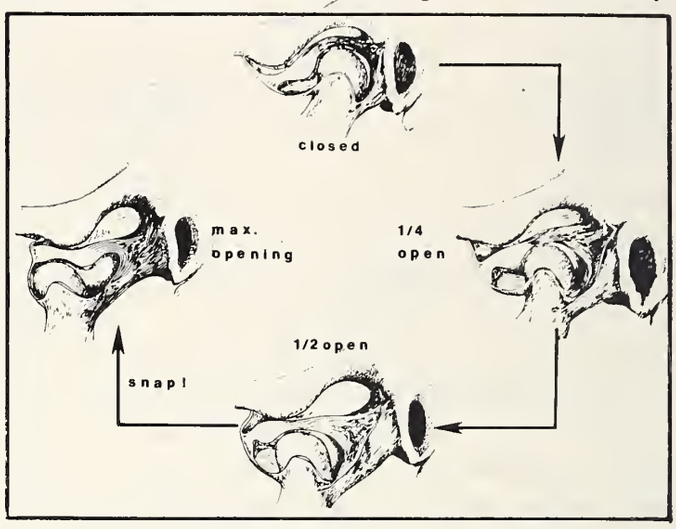


Fig. 8—Illustration of incoordination mechanism.

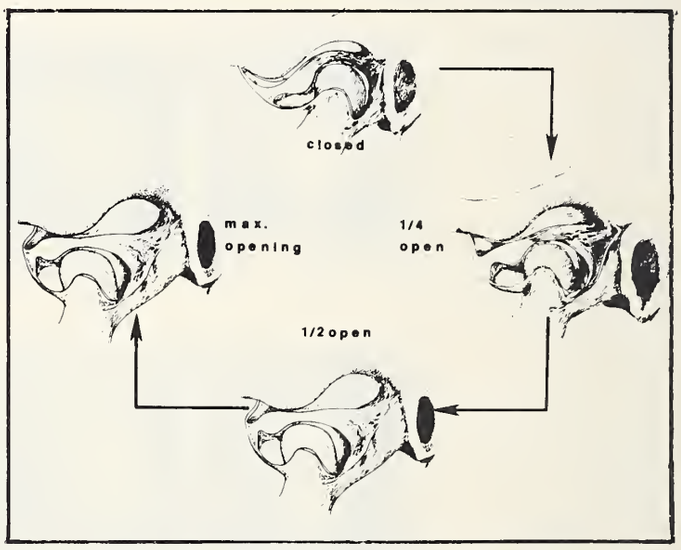


Fig. 9—Illustration of "closed lock" mechanism.

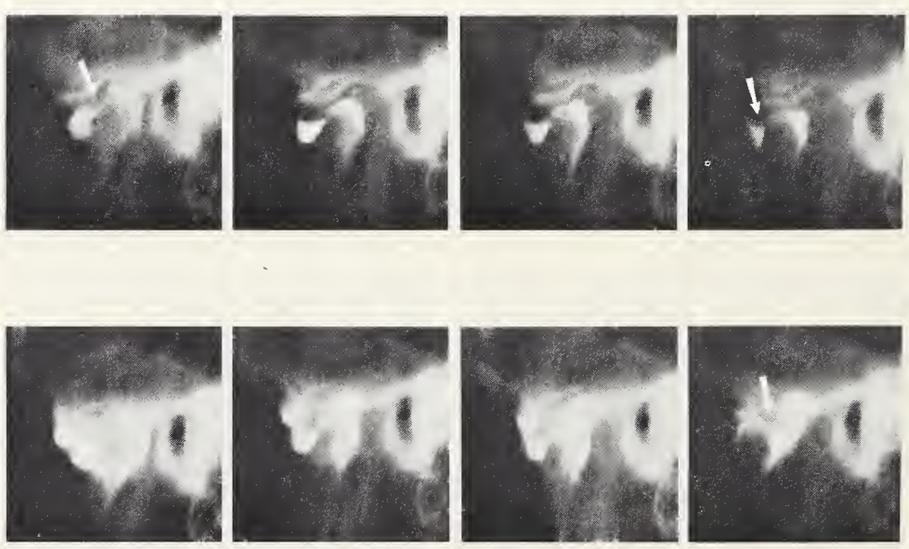


Fig. 7—Arthrographic opening sequence which demonstrates late incoordination and "closed lock". Arrows designate posterior edge of disc.

displaced disc when in a ''closed lock'' situation or for late incoordination is difficult to discern. An approximation is given in the drawings of Figures 8 and 9. Another typical example of ''closed lock'' is shown in the arthrographic sequences, Figure 10. An arthrogram from a case with long duration of symptoms, Figure 11, is similar to the latter films except for one significant difference. Note the loss of anatomical contour of the disc and the thickening of the posterior edge. It is apparent that the condyle head was unable to clear the thickened mass of cartilage.

Discussion

It seems clear that arthrography of the temporomandibular joint is an effective method of assessing the anatomical integrity and function of joint structures. As shown, various intrajoint changes associated with TMJ disorders can now be identified. The arthrographic procedure can also be of significant value in differential diagnosis of other facial and head pain disorders.

The fundamental pathophysiological mechanisms of the TMJ pain-dysfunction syndrome have not yet been delineated. Experiences with arthrography in cases of this nature including the examples as given here, indicate with very high probability that the signs and symptoms of this syndrome are direct manifestations of internal derangements of the joint. The most common structural change appears to be anterior displacement of the articular disc. For this to occur it must be inferred that the posterior attachment of the disc has been partially stretched or disrupted. This has been confirmed on innumerable occasions with direct surgical observation. In such cases, it seems that incompetency of the posterior attachment is one of the fundamental mechanisms operating in the production of symptoms. Slight incompetence results in minor dysfunction, that is early incoordination symptoms. A greater degree of incompetency results in the production of late and loud snapping joint sounds and/or transient catching or locking and/or episodic or sustained ''closed lock''. Other internal derangements



Fig. 11—Arthrogram of case which demonstrates degenerative changes of the articular disc.

have also been identified arthrographically and surgically, namely partial or complete disruption of the articular disc itself or the anterior attachment.

Additional investigative effort is necessary to determine the detailed nature of some of the internal derangements of the temporomandibular joint as discussed, and further, the correlation of physical manifestations and symptomatology of TMJ disorders with the joint changes observed. Considerations must be given to the role of internal derangements with respect to spontaneous dislocation or "open lock". The possibility of auto-induced progression to frank degenerative states secondary to an initial internal derangement of the temporomandibular joint must also be considered in future studies.

Summary

Experiences with arthrography of the temporomandibular joint in a number of patients with the TMJ pain-dysfunction syndrome have been provided. Various internal derangements of the temporomandibular joint have been identified in such cases. The most common internal derangement found was displacement of the articular disc with concomitant partial disruption of the posterior attachment of the disc. Direct surgical observation in a number of these patients confirmed the arthrographic interpretations.

Acknowledgments

The author wishes to express his appreciation for the assistance and cooperation of both technical and professional staffs of the Department of Radiology, Methodist Hospital, St. Louis Park, Mn.

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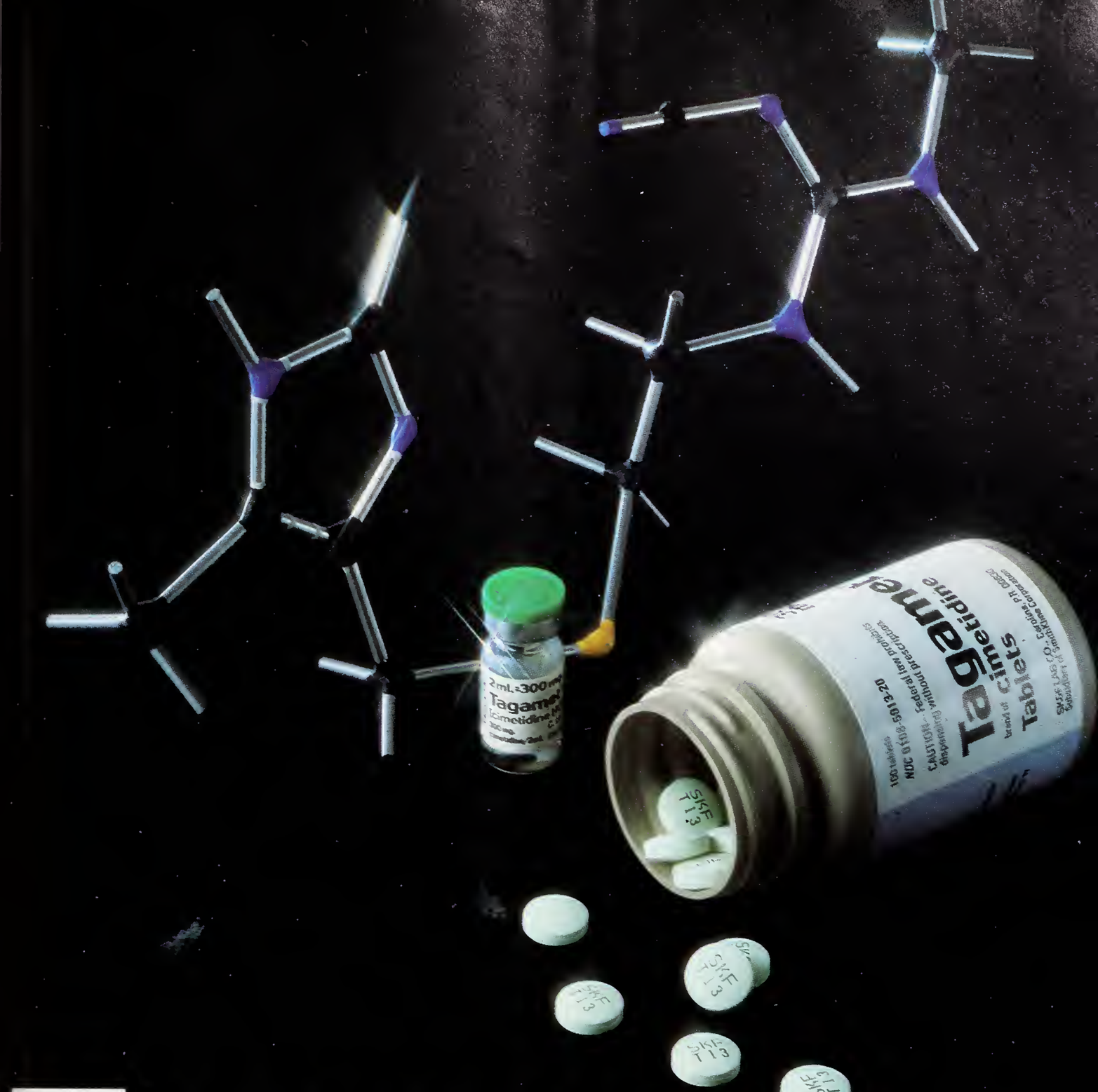
Cover Photograph

"Waiting for Breakfast"

Dr. Earl C. Henrikson, Minneapolis surgeon, took the cover photograph some years ago in Arizona with a 135 mm. lense on a Contax camera, using Kodachrome ASA 25 film.

The picture is of mature, miniature white-crowned sparrows taken at a friend's home in Green Valley, Arizona, by Dr. Henrikson, while having breakfast with him. They were on their way into Madera Canyon in the nearby Santa Rita Mountains to take movies and slides of the many beautiful birds found there. The birds flew into a nearby tree waiting for a "hand-out" of crumbs which they received each morning.

Dr. Henrikson tells the editors that photography has been his hobby since high school days, especially nature photography.



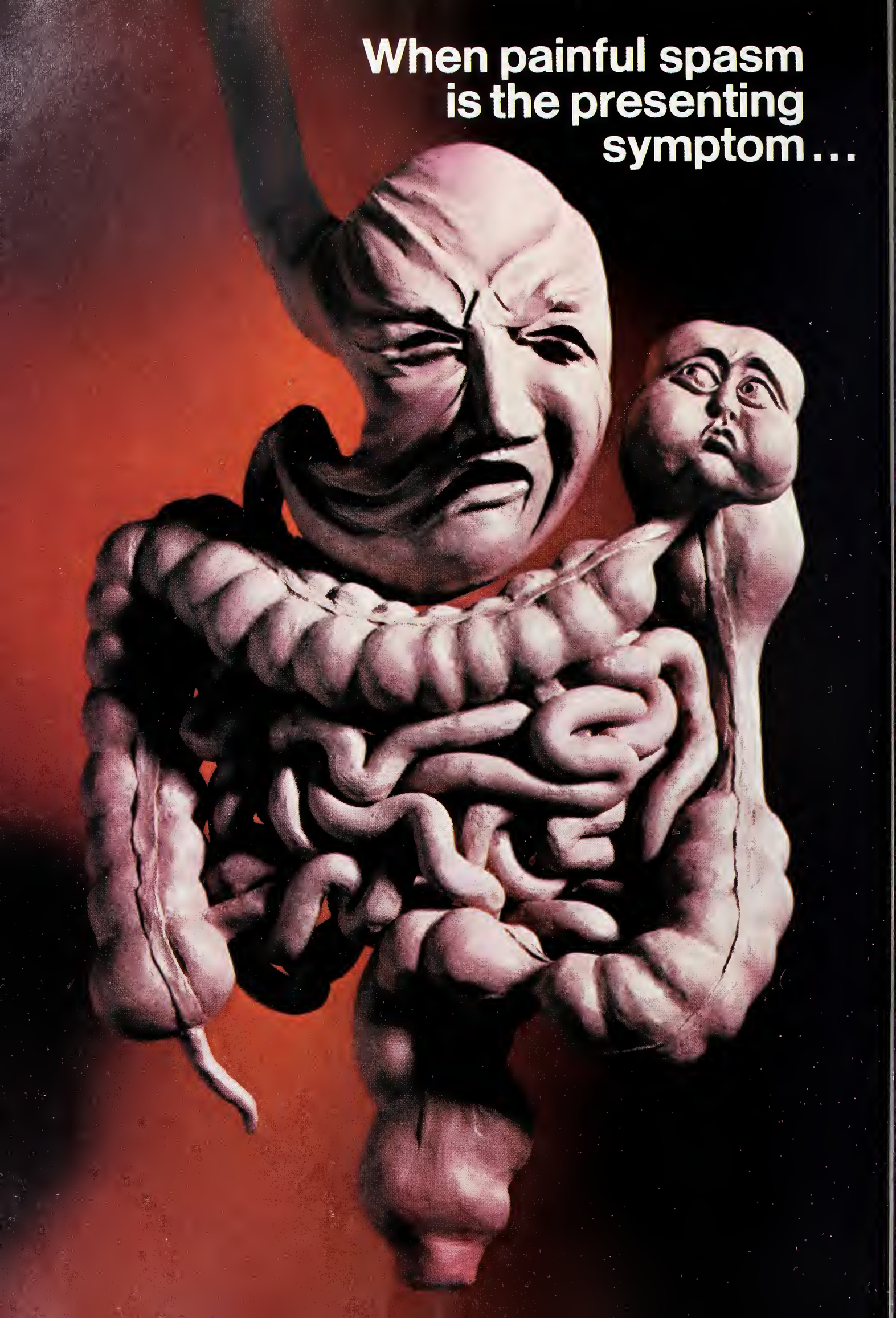
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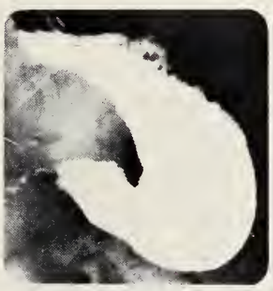
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†See Warnings, Precautions and Adverse Reactions.

See following page for prescribing information.

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King, J.C. and Starkman, N.M.: Evaluation of an antispasmodic. Double-blind evaluation to control gastrointestinal spasms occurring during radiographic examination. A preliminary report. Western Med. 5:356-358, 1964.

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Based on a review of this drug by the National Academy of Sciences—National Research Council and/or other information, FDA has classified the following indications as "probably" effective:

May also be useful in the irritable bowel syndrome (irritable colon, spastic colon, mucous colitis, acute enterocolitis, and functional gastrointestinal disorders); and in neurogenic bowel disturbances (including the splenic flexure syndrome and neurogenic colon).

THESE FUNCTIONAL DISORDERS ARE OFTEN RELIEVED BY VARYING COMBINATIONS OF SEDATIVE, REASSURANCE, PHYSICIAN INTEREST, AMELIORATION OF ENVIRONMENTAL FACTORS.

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Rheumatology Corner

Rheumatoid Arthritis as a Systemic Disease

GERALD T. MULLIN, JR., M.D.*

ALTHOUGH INVOLVEMENT of the joints is the most prominent feature of rheumatoid arthritis, it is truly a systemic disease and failure to appreciate this fact can mask the diagnosis. Systemic symptoms may not be explained to the satisfaction of the patient and physician and the search for a diagnosis can go on with laboratory tests and x-rays, which give no answers. Frequently joint symptoms are the most prominent and disabling manifestation, while at the other end of the spectrum, fever, fatigue and malaise and stiffness predominate and the joint changes might be subtle. We call it rheumatoid arthritis and appreciate it as one disease, but perhaps in the future as we know it better we may be able to identify subgroups with different clinical manifestations and prognoses and we may be able to treat them differently.

As the disease unfolds, other closely related diseases having synovitis as a prominent feature must be sorted out. Scleroderma or systemic lupus erythematosis may look reasonably similar early in the course. Physical findings will help differentiate more frequently than laboratory tests which may even be misleading. The demonstration of rheumatoid factor, an LE cell or antinuclear antibodies, must be correlated with the clinical situation. The American Rheumatism Association tells us to go back to clinical clues and add them up to make a diagnosis. This should not astound us and should cheer us in our search for answers. We can be freed from the whims of the laboratory and can use our senses of sight, touch and hearing to fully appreciate the patient.

The joint examination must be complete. A rheumatologist frequently sees patients who are said to have a single joint involved, such as a knee, and the diagnosis is in doubt. The answer lies in finding a tender swollen metatarsophalangeal joint, a swollen wrist, or swollen sternoclavicular joint that was missed. From there the search goes to all other organ systems that could be involved and disturbed by rheumatoid arthritis. Tendonitis represents a similar process in tendon sheaths as synovitis in joints and can be found on examination. Palmer flexor tendons are frequently thickened and tender and sometimes snap in rheumatoid arthritis.

*Rheumatologist, Minneapolis, Minnesota.

The rheumatoid nodule should be searched for particularly around the elbow and has a distinctive feel. It may also be present in tendons such as the Achilles tendon and over bony pressure points. Occasionally to distinguish it from a gouty tophus a biopsy must be done. Other evidence of vasculitis in the skin should be search for looking for nail bed infarction and skin ulcers around the fingers and lower legs and occasionally over a rheumatoid nodule. It must be remembered however, that cutaneous vasculitis can be found in other diseases such as systemic lupus erythematosis or scleroderma but not the rheumatoid nodule.

Neuropathy can occur, the most commonly seen is median nerve entrapment at the wrist with entrapment around the elbow or ankle much less common. Sensory neuropathies are more difficult to find and are related to vasculitis of peripheral nerves. They frequently do not show on an EMG. Sensory motor neuropathies announce themselves and bear a much more serious prognosis.

Lymphadenopathy is common in rheumatoid arthritis, and the size and feel of the node help to decide when a biopsy is indicated, which is not very often. Splenic enlargement occurs occasionally and may be associated with Sjogren's syndrome that interesting variety of rheumatoid arthritis with dry eyes, dry mouth, salivary gland enlargement and other curious physical findings and laboratory findings. Hypersplenism can be associated with splenic enlargement and is called Felty's syndrome. Eye symptoms of red, scratchy eyes are common in rheumatoid arthritis and are not necessarily associated with dry eyes.

Dyspnea and pleurisy and an abnormal chest Xray lead one to a diagnosis of pulmonary involvement with rheumatoid arthritis. Diffuse pulmonary infiltrates, fibrosis, pulmonary nodules and pleural effusions can be seen. You must be sure not to blindly attribute all to rheumatoid arthritis however, and rule out tuberculosis and other pulmonary infections and tumors.

The hand is the "calling card" of the arthritic, according to Dr. Phillip Hench. Time must be spent examining it, looking for the pitted nails of psoriasis,

skin changes of Raynaud's phenomenon, and the cold sweaty hand of some rheumatoid patients. Synovitis and destruction of joint capsules, tendons, and bones are quite apparent.

Puzzles occur and things might not be the same as in the text books as the variety of nature is unmatched. Time sequences in disease evolution must be appreciated with changing physical findings from one moment to another. As physicians we are sometimes given the clues in a stingy fashion and must simply remember that rheumatoid arthritis is a systemic disease.

Student Loan Fund

A few recent telephone calls produced some data on medical school costs, which throws a light on the Medical Association's desire to strengthen its capability of aiding medical students during their training years. The figures were obtained by talking with generally pleasant young ladies who are employed in the administrative offices of several universities. They may not be precisely accurate, but they do define a range of costs which on the surface are clearly beyond the fiscal resources of most students and probably beyond the capability of most families. Here are the numbers:

University	Tuition	Housing (Campus)	Books & Supplies	Total
U of Minnesota				
Resident	$2211.75 ($737.25 per quarter)	$2133.00	$500	$4855.75
Nonresident	$5667.75 ($1889.25 per quarter)	$2133.00	$500	$8300.75
John Hopkins	$4700	$1580	$275	$6555
Harvard	$5750	$1485	$275	$7510
Creighton	$5210	no campus housing	$570	$?

Remember, these are not derived from the university bulletins and are not official. There are some inconsistencies. For example, one wonders how it's possible for a student to live for a year in Boston for $1485, or in Baltimore for $1580. In any case, they are a far cry from the $275 per quarter we paid in the late 30s and early 40s. Also, the total excludes a number of essential costs of living expenses which students must meet. They explain the concern of the Medical Association's Board of Trustees and its charge to our committee to continue efforts at strengthening the assets of the Student Loan Fund of the foundation of the MMA. All MMA members are being solicited for donations, as are all auxilians.

Component medical societies are also being asked to examine this fund as a suitable recipient of their excess money. When you receive your letter of solicitation, give it your thoughtful attention. Be generous and encourage your colleagues to be generous. It is a worthy cause!

John J. Regan, M.D.
Chairman

Minnesota Medical Association

Not All Births Are "Blessed Events"

Legal Perils of Vasectomy

ROBERT BENJAMIN, M.D.*

A Minnesota Supreme Court ruling of last year[1] is consonant with several court decisions during the last eleven years, which have forged new rights of recovery for patients having unwanted conceptions.[2-6]

The Court stated that "compensible damages for the birth of a normal, healthy child, approximately caused by a negligently performed sterilization operation for the purpose of preventing conception . . . may be recovered by the parents of the child for prenatal and postnatal medical expenses, the mother's pain and suffering during pregnancy and delivery, loss of consortium and additionally, the reasonable costs of rearing the unplanned child subject to *offsetting this item of damages by the value of the child's aid, comfort, and society during the parents' life expectancy*". Offsetting the damages by subtracting the value of the child's aid, comfort, etc. would seem to be a new expectation by the courts — that of expecting juries to have the wisdom of Solomon in their deliberations. However, previously courts have used this offsetting procedure in determining judgment in similar cases.

Following the birth of their seventh child a husband and wife, in consultation with a physician, reached a decision that the husband should undergo vasectomy, which operation was performed on December 11, 1970. They were counselled to utilize contraceptive measures until postoperative testing revealed the husband's semen to be free of sperm.

On January 23, 1971, he brought a semen specimen to a clinic for testing. Later that day (according to plaintiff) the physician telephoned the husband and informed him that the results of the test were "negative". The plaintiff further testified that the physician did not advise him to return for additional testing, nor was there any discussion concerning the need for continued use of contraceptives. In fact, the January 23rd test revealed that the husband's semen had a sperm density of five to 10 sperm cells per high powered microscope field and that 10% of these were motile.

Although the physician testified to having no recollection of the telephone conversation with the plaintiff, he was permitted to testify that, based upon his usual habit, he would have told the plaintiff that the presence of live sperm cells indicated he was not yet sterile and that he should bring in a second sample in two to three weeks. Relying on the erroneous belief that the operation had been successful, the couple resumed normal sexual relations without contraceptives. To their consternation, the wife began to miss her menstrual periods several months later. On August 5, 1971 the husband returned to the Clinic for a second test and he was correctly advised that the vasectomy had been ineffective. The following day it was determined that his wife was pregnant, and she delivered a healthy baby boy on March 6, 1972. They brought suit claiming the birth of their eighth child was the direct result of the physician's negligent postoperative care of the husband.

That the jury had chosen to believe the plaintiff's version of the phone call was accepted by the Supreme Court. (A note in the patient's chart regarding the phone call might have resulted in a different verdict.)

The Supreme Court remanded the case back to the trial court for a new trial limited solely to the issue of damages. The trial court had originally awarded the couple a judgment of $19,500, but had arrived at this sum without being given "explanatory instructions" and a "special verdict form". The Court ruled that in all future actions for wrongful conception these special instructions and forms be submitted to the jury.

The courts have recently held that awards in cases of unwanted conception are not for the new person as such, but rather a compensation for the "diminution in the family wealth that necessarily resulted in a hardship to the other members of the family".[7] Awards in similar cases have all been nominal when compared to many awards given in medical liability suits.

Prevention of legal problems following sterilization procedures can be accomplished by the following:

1. Write into the patient's chart all significant information and advice given *over the phone*.
2. Never promise that a vasectomy provides "100% certainty". Make certain that the patient understands that there is no guarantee he will become, or remain, sterile.
3. The patient should understand that vasectomy usually produces sterility that *is not reversible*.
4. Good counselling, involving not only the patient but his wife if possible, will result in better understanding of vasectomy and less likelihood of litigation.
5. Obtaining signed consent, indicating knowledge of the risks and precautions related to the procedure.

It is my opinion that recent court decisions such as

*St. Louis Park Medical Center, Minneapolis.

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from papers presented at 82nd Annual Mtg. - A.A.O.O. as reported in Dec./77 "Hearing Instruments"

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"Remember . . . the aid is fitted to the patient — not the audiogram. We don't fit hearing losses. . . . we fit hearing residual." *C. W. Gross, M.D.*

"No one is qualified to state whether a person can or can not use a hearing aid until such time as you take a hearing aid, couple it to a person's ear and place the aid and the patient together in the patient's environment."
Aram Glorig, M.D.
as quoted by Lindsey Pratt, M.D.

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Clyde F. Marquardt

Sherlock vs Stillwater Clinic should not deter physicians from continuing to perform sterilization procedures taking the aforementioned precautions into account.

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2. Custodial vs. Bauer, California, 1967.
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7. Christianson vs. Thornby, 192 Minn. 123, 255 N.W. 620,93 ALR 578, 1934.

Continuing Medical Education

New Mexico Metabolism Symposium
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Erratum

With regard to my publication entitled "The Cardiac Research Committee After Twenty-three Years,"* I must submit comment on an error in the manuscript which is located in the second column of the second page which is on 544 in the fifth paragraph of MINNESOTA MEDICINE. I identify in the last sentence, "later a research laboratory was established in the abandoned kitchen in St. Mary's Hospital and now a laboratory at Unity is in use under the direction and supervision of Doctor Paul Gannon." This should read, "and now a laboratory at Mercy Hospital is in use under the direction and supervision of Doctor Paul Gannon." If this correction could be made in the next issue of Minnesota Medicine I would be appreciative.

Joseph J. Garamella, M.D.
Minneapolis, Minnesota

*September issue.

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Tenuate® Ⓒ
(diethylpropion hydrochloride NF)

Tenuate Dospan®
(diethylpropion hydrochloride NF) controlled-release

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Brief Summary
INDICATION: Tenuate and Tenuate Dospan are indicated in the management of exogenous obesity as a short-term adjunct (a few weeks) in a regimen of weight reduction based on caloric restriction. The limited usefulness of agents of this class should be measured against possible risk factors inherent in their use such as those described below.
CONTRAINDICATIONS: Advanced arteriosclerosis, hyperthyroidism, known hypersensitivity, or idiosyncrasy to the sympathomimetic amines, glaucoma. Agitated states. Patients with a history of drug abuse. During or within 14 days following the administration of monoamine oxidase inhibitors, (hypertensive crises may result).
WARNINGS: If tolerance develops, the recommended dose should not be exceeded in an attempt to increase the effect; rather, the drug should be discontinued. Tenuate may impair the ability of the patient to engage in potentially hazardous activities such as operating machinery or driving a motor vehicle; the patient should therefore be cautioned accordingly. *Drug Dependence:* Tenuate has some chemical and pharmacologic similarities to the amphetamines and other related stimulant drugs that have been extensively abused. There have been reports of subjects becoming psychologically dependent on diethylpropion. The possibility of abuse should be kept in mind when evaluating the desirability of including a drug as part of a weight reduction program. Abuse of amphetamines and related drugs may be associated with varying degrees of psychologic dependence and social dysfunction which, in the case of certain drugs, may be severe. There are reports of patients who have increased the dosage to many times that recommended. Abrupt cessation following prolonged high dosage administration results in extreme fatigue and mental depression; changes are also noted on the sleep EEG. Manifestations of chronic intoxication with anorectic drugs include severe dermatoses, marked insomnia, irritability, hyperactivity, and personality changes. The most severe manifestation of chronic intoxications is psychosis, often clinically indistinguishable from schizophrenia. *Use in Pregnancy*: Although rat and human reproductive studies have not indicated adverse effects, the use of Tenuate by women who are pregnant or may become pregnant requires that the potential benefits be weighed against the potential risks. *Use in Children*: Tenuate is not recommended for use in children under 12 years of age.
PRECAUTIONS: Caution is to be exercised in prescribing Tenuate for patients with hypertension or with symptomatic cardiovascular disease, including arrhythmias. Tenuate should not be administered to patients with severe hypertension. Insulin requirements in diabetes mellitus may be altered in association with the use of Tenuate and the concomitant dietary regimen. Tenuate may decrease the hypotensive effect of guanethidine. The least amount feasible should be prescribed or dispensed at one time in order to minimize the possibility of overdosage. Reports suggest that Tenuate may increase convulsions in some epileptics. Therefore, epileptics receiving Tenuate should be carefully monitored. Titration of dose or discontinuance of Tenuate may be necessary.
ADVERSE REACTIONS: *Cardiovascular*: Palpitation, tachycardia, elevation of blood pressure, precordial pain, arrhythmia. One published report described T-wave changes in the ECG of a healthy young male after ingestion of diethylpropion hydrochloride. *Central Nervous System*: Overstimulation, nervousness, restlessness, dizziness, jitteriness, insomnia, anxiety, euphoria, depression, dysphoria, tremor, dyskinesia, mydriasis, drowsiness, malaise, headache; rarely psychotic episodes at recommended doses. In a few epileptics an increase in convulsive episodes has been reported. *Gastrointestinal*: Dryness of the mouth, unpleasant taste, nausea, vomiting, abdominal discomfort, diarrhea, constipation, other gastrointestinal disturbances. *Allergic*: Urticaria, rash, ecchymosis, erythema. *Endocrine*: Impotence, changes in libido, gynecomastia, menstrual upset. *Hematopoietic System*: Bone marrow depression, agranulocytosis, leukopenia. *Miscellaneous*: A variety of miscellaneous adverse reactions has been reported by physicians. These include complaints such as dyspnea, hair loss, muscle pain, dysuria, increased sweating, and polyuria.
DOSAGE AND ADMINISTRATION: Tenuate (diethylpropion hydrochloride): One 25 mg. tablet three times daily, one hour before meals, and in midevening if desired to overcome night hunger. Tenuate Dospan (diethylpropion hydrochloride) controlled-release: One 75 mg. tablet daily, swallowed whole, in midmorning. Tenuate is not recommended for use in children under 12 years of age.
OVERDOSAGE: Manifestations of acute overdosage include restlessness, tremor, hyperreflexia, rapid respiration, confusion, assaultiveness, hallucinations, panic states. Fatigue and depression usually follow the central stimulation. Cardiovascular effects include arrhythmias, hypertension or hypotension and circulatory collapse. Gastrointestinal symptoms include nausea, vomiting, diarrhea, and abdominal cramps. Overdose of pharmacologically similar compounds has resulted in fatal poisoning, usually terminating in convulsions and coma. Management of acute Tenuate intoxication is largely symptomatic and includes lavage and sedation with a barbiturate. Experience with hemodialysis or peritoneal dialysis is inadequate to permit recommendation in this regard. Intravenous phentolamine (Regitine®) has been suggested on pharmacologic grounds for possible acute, severe hypertension, if this complicates Tenuate overdosage.

Product Information as of April, 1976
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References: 1. Citations available on request—Medical Research Department, MERRELL RESEARCH CENTER, MERRELL-NATIONAL LABORATORIES, Cincinnati, Ohio 45215. 2. Hoekenga, M.T., O'Dillon, R.H., and Leyland, H.M.: A Comprehensive Review of Diethylpropion Hydrochloride. International Symposium on Central Mechanisms of Anorectic Drugs, Florence, Italy, Jan. 20-21, 1977.

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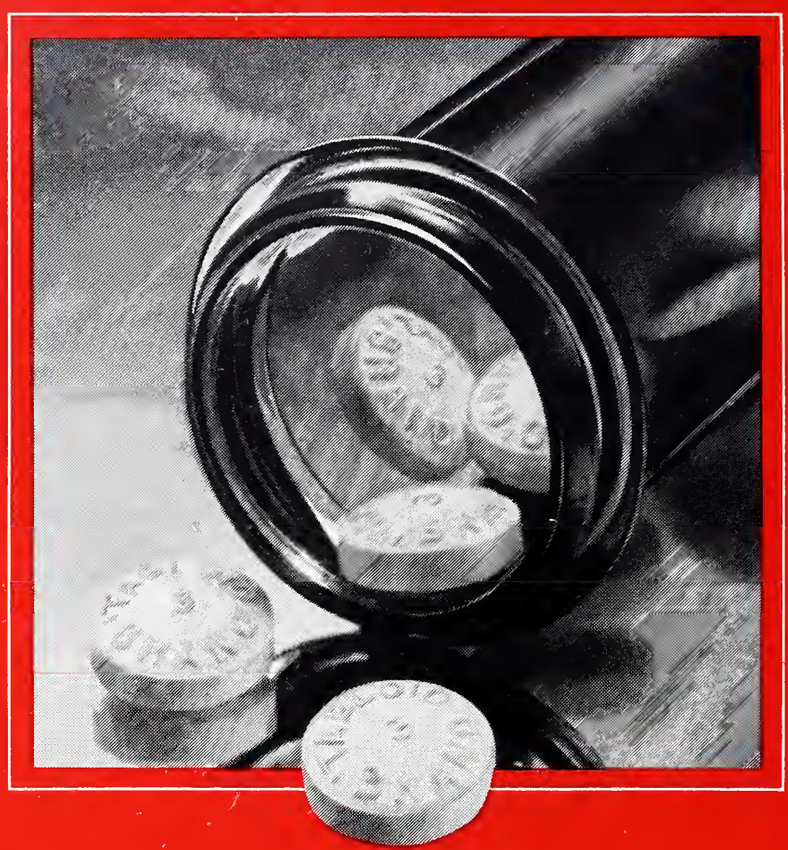
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Minnesota Medical Association

Conversation with Dr. Richard K. Simmons, Family Practitioner and Medical Director of the Physicians' Health Plan



Dr. Richard Reece Dr. Richard K. Simmons

Dr. Richard Reece:

Dr. Simmons, I'd like to talk to you about the concept, evolution, and performance of the Physicians' Health Plan. What is your position with that organization?

Dr. Richard K. Simmons:

Since May 1st, I have been part time medical director. Last year I was Chairman of the Board, and before that, president.

Dr. Reece: *How long has the Physicians' Health Plan existed?*

Dr. Simmons:

It was formed in 1974, became licensed in the summer of 1975, and began operating at the end of 1975.

Dr. Reece: *What led to forming this HMO?*

Dr. Simmons:

There were many factors. The Physicians' Health Plan, incidentally, is a six-county Metropolitan operation, excluding Ramsey County. We formerly called it the Physicians' Health Plan of Greater Minneapolis, but we've dropped the Greater Minneapolis aspect.

The main factor was that organized medicine, specifically the Hennepin County Medical Society, was looking for ways to involve itself in the insurance aspect of medicine, rather than traditional disaster or crisis care. In other words, we were

Photographer: Dr. Farrell Stiegler.

looking at encompassing prepayment insurance, involving doctors' offices. That was number one.

Number two, there was obviously an HMO threat to private practice in Hennepin County. We are a hotbed of HMOs with seven HMOs in the metropolitan area. That is more than any other comparable place in the country. Many physicians were seeing their patients leaving them and going to HMOs.

Dr. Reece: *So it was partly a defensive reaction.*

Dr. Simmons:

Absolutely. Certainly it was not entirely an altruistic thing. But a challenge was there. We wanted to get involved in an experiment that was exciting, new, and different.

Dr. Reece: *Has it been exciting?*

Dr. Simmons: It has been terrifically exciting.

Dr. Reece: *How well has the Health Plan performed since you were licensed in 1975?*

Dr. Simmons:

We started slowly. At the end of 1975, we had enrolled only four or five groups of patients. Then in 1976 we obtained our largest group, the many families of the Hennepin County government. The Hennepin County government enrollment expanded our roles quickly in 1976. Through 1976 we added other firms and organizations and groups, so that by the end of '76 we had about twenty to twenty-five organizations, constituting about 12,000 individuals. Now we have 25,000 patients.

We had something happen the last two years which is kind of the American dream, that is, we started out with a relatively new concept, certainly not all to our credit, there were other physician HMOs throughout the country. We put it together and sold it. We had a difficult time in 1976. In fact we were $500,000 in debt through 1976. In 1977, we turned the Plan around into a profitable, expanding organization.

Now. how did we do it? We found in 1977, that if we were going to have this organization survive financially, we had to institute controls with teeth. We could not just ask: Will you please do this, will you please do that? But actually: you will do it and if you don't do it, there would be sanctions involved. And, sanctions mean, physicians would not receive their fees.

Dr. Reece: *What were those controls?*

Dr. Simmons:

Basically, the controls involved two things: (1) Controlling *in hospital utilization*, with preadmission certification, close follow-up of patients in hospitals and encouraging doctors not to hospitalize patients when procedures could be done efficiently as an out-patient. That is one area. (2) The other area is *reviewing how physicians practice in their offices day to day.* This is made possible through a computer.

Dr. Reece:

Suppose you want to admit a patient yourself, what is the procedure you go through to gain approval of the Health Plan?

Dr. Simmons:

The nurse or the receptionist, who normally takes care of hospital admissions, will call the Physicians Health Plan. She tells the Plan's utilization coordinator that Jane

Doe is planning to go into the hospital, that Dr. so and so wants Jane Doe to go into the hospital, gives the diagnosis, and that is it.

After that, on the basis of foundation experience and P.A.S. experience, the Physicians Health Plan will send a letter to our office acknowledging that Jane Doe is going into the hospital, and will give an authorized length of stay for that patient. If the patient is still in the hospital, at the end of the length of stay; the utilization coordinator will check with our office to find out what is happening with the patient. In other words, why is the patient still in the hospital?

Dr. Reece:

So the Plan raises the physician's level of conscientiousness. You have to make a conscientious act to admit a patient, and a conscientious act to keep the patient in the hospital.

Dr. Simmons: Right.

Dr. Reece: *How many doctors have you got in the program now?*

Dr. Simmons:

About 1300. They represent about 90 percent of practicing physicians in the six-county area. Seventy-five physicians have left for various reasons, mostly because of death or retirement or moving away from the area. However, we have had 175 other physicians join. In the last few weeks, we have had many physicians' applications to belong to PHP. Up 'til now, they had stood in the wings.

Dr. Reece: *I understand when you started the physicians received 80 percent of fees?*

Dr. Simmons:

Yes, there was a 20 percent withholding, Physicians' Contingency Reserve it's called. During early 1977, when we were having continued financial difficulties, we decided to be viable; we had to bite the bullet, and we raised that Contingency Reserve to 30 percent, instituting at the same time controls. This obviously meant increased reserve monies; and with the improvements that occurred toward the end of 1977, we were able to roll that back to 25 percent in March 1977. We are now back to 20 percent withholding.

Dr. Reece:

How much money have the doctors of the six counties invested in this program?

Dr. Simmons:

The total Physicians' Contingency Reserve is $470,000. In other words, $470,000 of withheld physicians' fees are used to cover deficits.

Dr. Reece: *Will physicians get this money back?*

Dr. Simmons: They will not.

Dr. Reece:

There is, then, almost a half million dollars of physicians' money invested without federal money and without a request for it.

Dr. Simmons: Correct.

Dr. Reece:

You haven't said anything about your patient population. According to conventional wisdom to make an HMO go financially, you need 20,000 patients. How many do you have?

Dr. Simmons:

We have 25,000 people right now, and for the last 11 months we have made a profit, not including the Physicians' Contingency Reserve.

Dr. Reece:

Pundits say there are two problems with starting a HMO, and these are fundamental and generic to the species. One of them is the tremendous start-up cost and the other is marketing. What were your start-up costs and how do you market this health plan?

Dr. Simmons:

The start-up costs were held to a minimum, because there were no offices nor buildings to build. We were already in business in private physicians' offices. Also, we used the personnel from the Hennepin County Medical Society to start up. In addition, the St. Paul Companies loaned us about $239,000 of the start-up money, and the Hennepin County Medical Society chipped in $55,000 in loan money.

For the first two years, the St. Paul Companies were the marketing people. They went out to organizations and groups and sold the plan. Of course, they received a marketing fee for their services. I personally feel the St. Paul Companies got involved because they had guilt feelings over the malpractice condition in Minnesota. Being a local company, with the rise in malpractice insurance costs, they had some feeling of guilt and wanted to be nice guys.

Dr. Reece: *What are your rates compared to your HMO competitors?*

Dr. Simmons:

By necessity, in order to sell a plan, we have to be competitive, and rates have to be close. We have found, over the last two and a half years, people are willing to pay a small premium to continue their present patient-physician relationship. But, this has to be a limited amount.. Most families are unwilling to pay more than $10 a month for this. Because of this, we are competitive with our HMO competitors. We have to be in order to sell. If we are too much off base, companies won't even offer our plan to their employees. So we have to be competitive.

Dr. Reece:

Does the Physicians Health Plan include only physicians as professionals?

Dr. Simmons:

No. We also have a strong contingency of over 300 pharmacists in our plan, this allows patients to get their prescriptions at a local level. Of course, we do pay for para-medical help such as psychologists, therapists, and others who are needed for the patient's benefit.

Dr. Reece: *Prescriptions are paid for at a fixed rate. What, $2.00 a prescription?*

Dr. Simmons: There is a co-payment of $2.50 per prescription.

Dr. Reece: *Is there any co-payment for office visits?*

Dr. Simmons:

There is with some groups. Very few, however, and co-payments are going out. Actually we found out patients do not abuse the Plan. We were afraid of that. Some groups do have a $3.00 co-payment on office visits, but as soon as we can eliminate this, we will.

Dr. Reece: *What illnesses, conditions, or types of patients do you exclude from your plan?*

Dr. Simmons: We can't exclude anybody. If a group signs up; if a company signs up; and employees want to sign, we can't exclude them.

Dr. Reece: *There are no pre-physicals or anything like that?*

Dr. Simmons: No.

Dr. Reece:

I gather that most physician-participants in the Plan have a dual existence. They belong to the Hennepin County HMO and have fee-for-service patients also.

Dr. Simmons:

Absolutely. I don't think any physician presently has any more than 5 percent of his total practice as PHP, and most physicians have considerably less than that.

Dr. Reece:

Have any studies been made of the comparable hospitalization rates of these dual practices? Supposedly an HMO is a self-disciplining, organizational mechanism whereby you cut down the number of hospitalizations.

Dr. Simmons:

In Hennepin County, the Blue-Cross Blue-Shield hospitalization rate runs about 900 to 1000 patient days per 1000 people. In 1976 the Physicians' Health Plan was about 755 patient days per 1000, but in 1977 we were down to about 650 patient days. In 1978 we are less than 550 patient days.

Dr. Reece: *What for comparison, would be Group Health's and the St. Louis Park Clinic's HMOs hospitalization rates?*

Dr. Simmons: Both are in the 400s.

Dr. Reece: *Maybe it is important that you go into the background of Hennepin County Medical Society's interest in its own HMO.*

Dr. Simmons:

Officers from the Hennepin County Medical Society went to a symposium in Colorado in 1973, and they heard about the Independent Practice Association concept of HMOs. They came back to the Hennepin County Board of Directors and said that it might work in our area. After that, the Twin City Health Development Group sponsored a meeting on HMOs at a local motel. The group brought in people from across the country to talk about HMOs, from Wisconsin, Washington, Oregon, Group Health and various other places. The Hennepin County Board of Directors voted for a feasibility study, and Health Systems Incorporated, a research firm, came in and helped us with the study. There was a 35-man committee that worked on this all of 1974 and early '75. The study was supported by the Hennepin County Medical Society.

Another strategic situation was going on in our community. Many hospitals were trying to bring HMOs into their own hospital. This, in effect, would have set up little feudal states around the hospital with the idea that if a certain company was in that area, it would belong to that hospital. The Hennepin County Medical Society directors felt this would split medicine and be a bad influence on the congenial atmosphere of practice in this area.

Dr. Reece:

Let's try to put this HMO picture in perspective. Before 1973 when the Nixon HMO

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legislation came through, most existing HMOs were successful. Since then many have started, and many have failed. Why?

Dr. Simmons:

The Nixon legislation may have helped a lot of poorly planned HMOs get started.

Dr. Reece:

But, nevertheless, many recent well-planned HMOs have failed or have a tough time. For example, it took Harvard University seven years to turn the corner and get into the black with their HMO. Johns Hopkins had an HMO, and it failed in Columbia, Maryland. The HMO experience has not been uniformly favorable. Today only five percent of the people in the United States are under HMO coverage despite considerable federal pressures and publicity to push the idea. What do you see as the future of HMOs?

Dr. Simmons:

Many HMOs failed because of restrictive regulations that forced HMOs to accept high risk patients. These regulations were too hard to live with, and really probably had a lot to do with the failure of many of the HMOs that have gone down the drain. Still, the HMO concept is appealing to many people, particularly business people. As high as 40 percent of eligible employees will sign up for an HMO concept when given the opportunity. There are 190 HMOs in existence today in the United States, and there are another 150 on the drawing board, so HMOs seem to be gaining momentum.

Dr. Reece:

Recently the New England Journal *carried an article written by Enthoven*[1]*, a health economist who had worked for Califano. The title of the article was "Consumer Choice Health Plans." His concept of the future was that medicine would be run by competing health plans, with no place for fee-for-service practice. Do you think that fee-for-service and HMOs can coexist, and that a fee-for-service can survive in an atmosphere of consumer choice health plans?*

Dr. Simmons:

Most people, given their choice, would prefer to maintain their private physician relationship, so that they didn't have to go to a building or a hospital. That is the people's natural first choice. We demonstrate this when we go head to head with the other closed panel HMOs in our community. We don't know for sure whether fee-for-service will survive. We think it can. There is enough flexibility in traditional private practice so we can compete with a closed panel organization and still maintain fee-for-service concept and private practice. It can be done. We're demonstrating that today; we demonstrated it during the last half of '77 and into '78. The final chapter has not been written. We certainly hope fee-for-service will exist, continue, and thrive.

Dr. Reece: *You like the idea of competing, pluralistic organizations?*

Dr. Simmons:

It's good for everybody. It is good for the closed panel people to know that we are there. You both benefit because they are there and you are there.

One of the initial worries was: the only way you make money is to ration care. This is the traditional argument about HMOs. We don't think it has to be that way. You can give good care; you can give the care that people need and deserve and still be competitive and do something about controlling health care cost increases.

Dr. Reece:

Critics would say a physician-run health plan does not have enough discipline to sustain itself, and yet you are telling me that in your plan, physicians have been disciplined through a few simple controlling mechanisms.

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Dr. Simmons:

Yes, they have. I should add here that by law we have consumers on our board. We have experienced a phenomena that surprised us. We were fearful of having consumers on the board of directors, but we had nothing to fear. These people when they learned more about our problems and what medicine is trying to do for people, they became fantastically supportive. They help us, and we're better off having them, than we were without them.

Dr. Reece: *How many people do you have on your board and how many are consumers?*

Dr. Simmons:

There are about 24 on the board, and 13 or 14 are physicians. The rest are consumers. It's written in the by-laws that there will always be a physician majority since the physicians are the ones who are paying the piper.

Dr. Reece:

Could you comment on why Minneapolis has more HMO participants per square mile than any other geographic terrritory in the United States?

Dr. Simmons:

Minnesotans are experimental people. They are not afraid to take a chance. They are innovators. They are to a degree liberal and at the same time conservative. Exactly why this is so, I really don't know, except it fits the type of people that we are here. People saw a way to try something different, and they did it. I am sure that Paul Ellwood's presence in our community has something to do with it. Group Health's being here already for years had something to do with it. I think there are many factors, in any event we have ten percent of our population in this metropolitan area that are in HMOs right now. Within the next few years, this may go to 20 or 25 percent.

Dr. Reece: *How do you account for the phenomenal growth of HMOs here?*

Dr. Simmons:

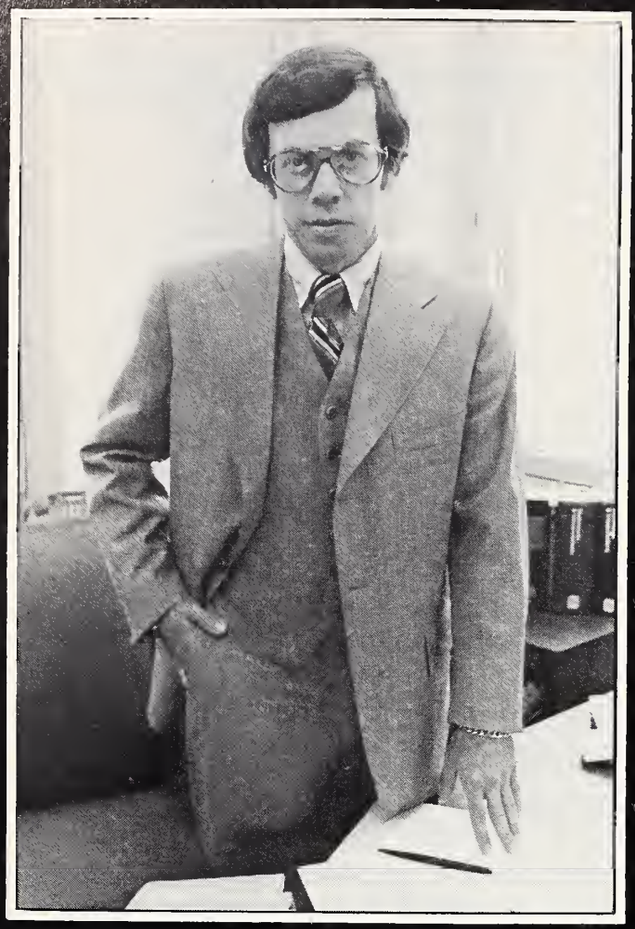
Again, I think it is that people like the idea of pre-paying their medical care. Not just the big things, but the everyday things, the day-to-day office calls, and Susie's shots, the lacerations and a possible sprained ankle, and all those things that occur to every family every year. They just like that idea.

Dr. Reece: *What is the average family rate?*

Dr. Simmons:

It varies per group. We individually rate each group. But, it's now between 90 and 100 dollars per family per month. A considerable amount of that is usually paid by the employer as a fringe benefit. By the way, another reason for HMO growth is that the law states that if you have 25 employees, you must offer an HMO along with the major medical plan. If there is a federally qualified HMO in the community the company has to offer the HMO as an alternative. There is a federally qualified HMO in our area, and that is SHARE, which is both in Ramsey and Hennepin Counties. When SHARE comes into a company, by law the company has to offer the SHARE HMO. No company is going to offer just one HMO. So, right away they search around for alternatives, and we hope to be right there at the door to present our plan to the people.

Initially, big business resisted the idea of a physician controlled HMO, mainly because we had no track record. But now that we are financially afloat, the tide is turning. Recently, for example, we signed up the Honeywell employees. Honeywell, as you know, is one of the largest employers in Minneapolis.



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Dr. Reece: *How did you win Honeywell?*

Dr. Simmons:

I really don't know; we presented our case, and their executives bought it after consulting with the employees.

Dr. Reece:

Could you tell me something about the administrative staff of your health plan? Where is it located? How many people are there?

Dr. Simmons:

We have space in the same building as the Hennepin County Medical Society (the Northwestern National Life Insurance Building). We have our own separate space there. We have a staff of six full time employees. Our overhead expense for administration is ten percent, which is considered excellent. Even during the difficult early times, we were able to hold down our administrative costs.

Our present administrator is Mr. Richard Burke who happens to be president of Charter Medical, and he has been of great help to us in our turnaround process. We do have a full-time utilization coordinator, and we recently hired a full-time marketing person. No longer do we market through the St. Paul Companies.

Dr. Reece:

In concluding this interview, what would you say you have learned, and what would you do different?

Dr. Simmons:

We have learned that to make a physician-run HMO go, you have to have rules and regulations with teeth. If we had it to do over again, we would have tried to institute these rules earlier. Physicians in the community learned from experience, from bitter experience, that in order to make this their plan, and this truly is their plan, they had to learn to live with rules and regulations. However, the rules and regulations are coming from their own peers. Not from on high, not from someone else whom they don't know. They rub shoulders with us every day, with the doctors in the hospitals, and they curbstone us on the board of directors. This give and take is what has really made the thing go. Our doors are always open to physicians who have concerns or questions about their plan. We sit down and talk it over with them face to face, not over the telephone, not through some administrator who is doing it. The physicians on the executive committee level and the board of directors sit down and talk over their mutual concerns.

Dr. Reece:

So you would say that these physicians, these rugged individualists, these independent mavericks, are capable of learning the rules of organizational discipline?

Dr. Simmons:

They have shown it. They have found it isn't all that bad. After all, we are, as far as I know, the largest independent practice in the United States, and we have been in the black for 11 months. We are perhaps the best known IPA in the United States. This is the third time I have been interviewed. The first two interviews appeared in *Medical World* News[2] and *AMA News*.[3] I was interviewed a fourth time by *Medical Economics*.[4] In the eyes of the medical media, we are not only the biggest, but the best.

References

1. Enthoven, Alain C.: Consumer-Choice Health Plan. New Eng J of Med 298:12:650, March 23, 1978 and 298:13:709, March 30, 1978.
2. Medical World News, page 81, March 6, 1978.
3. AMA News, page 6, July 14, 1978.
4. Medical Economics, page 97, July 10, 1978.

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Final classification of the less-than-effective indications requires further investigation.

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Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants, and against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Physical and psychological dependence rarely reported on recommended doses, but use caution in administering Librium® (chlordiazepoxide HCl) to known addiction-prone individuals or those who might increase dosage; withdrawal symptoms (including convulsions) reported following discontinuation of the drug.

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As with all anticholinergics, inhibition of lactation may occur.

Precautions: In elderly and debilitated, limit dosage to smallest effective amount to preclude ataxia, oversedation, confusion (no more than 2 capsules/day initially; increase gradually as needed and tolerated). Though generally not recommended, if combination therapy with other psychotropics seems indicated, carefully consider pharmacology of agents, particularly potentiating drugs such as MAO inhibitors, phenothiazines. Observe usual precautions in presence of impaired renal or hepatic function. Paradoxical reactions reported in psychiatric patients. Employ usual precautions in treating anxiety states with evidence of impending depression; suicidal tendencies may be present and protective measures necessary. Variable effects on blood coagulation reported very rarely in patients receiving the drug and oral anticoagulants; causal relationship not established.

Adverse Reactions: No side effects or manifestations not seen with either compound alone reported with Librax. When chlordiazepoxide HCl is used alone, drowsiness, ataxia, confusion may occur, especially in elderly and debilitated; avoidable in most cases by proper dosage adjustment, but also occasionally observed at lower dosage ranges. Syncope reported in a few instances. Also encountered: isolated instances of skin eruptions, edema, minor menstrual irregularities, nausea and constipation, extrapyramidal symptoms, increased and decreased libido—all infrequent, generally controlled with dosage reduction; changes in EEG patterns may appear during and after treatment; blood dyscrasias (including agranulocytosis), jaundice, hepatic dysfunction reported occasionally with chlordiazepoxide HCl, making periodic blood counts and liver function tests advisable during protracted therapy. Adverse effects reported with Librax typical of anticholinergic agents, *i.e.*, dryness of mouth, blurring of vision, urinary hesitancy, constipation. Constipation has occurred most often when Librax therapy is combined with other spasmolytics and/or low residue diets.

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Continuing Medical Education

Q and A — CME

The following questions concerning the CME rules of the Minnesota State Board of Medical Examiners are frequently asked. Dr. J. C. Cain, Chairman of the Board's CME Subcommittee, has supplied the answers. If readers have additional questions for Dr. Cain, please send them to *Minnesota Medicine*.

J. S. Welch, M.D.
Chairman
MMA Committee on
Medical Education

Question: What sort of format of reporting am I to expect? Should a detailed list be submitted?

Answer: The Board presently intends that physicians simply list the totals of CME hours in each category they are claiming. The physician's signature attests the validity of the report. Physicians are urged to keep the detailed listing of sponsoring organizations, hours of attendance, dates and supporting material for a minimum of 3 years, as some, by random selection, will be asked to supply this to the Board.

Question: How many credit hours may I count for a paper?

Answer: Ten credit hours under Category 4 may be claimed for a scientific paper or book chapter published in a scholarly medical journal or book. Ten hours of credit shall be granted for a paper presented before a professional medical or allied health audience. Note that credit may be claimed only once for each scientific material presented and there is a limit under Category 4 of "no more than 40 hours credit may be obtained in any (3-year) cycle".

Question: What procedure should be followed by a physician to obtain a waiver of the requirements because of prolonged leave of absence or disability?

Answer: Unfortunately, the law does not have any provision for waivers to be allowed. The Board is distressed about this rigidity and hopes to rectify the problem, but changes of law or rules require at least six to nine months.

Question: May I send in my CME report now? Where do I send it?

Answer: Prior to the end of 1978 the Board will send appropriate material to the physicians in Class I to assist them in the reporting procedure. Reports are not due until that time. Please, do not submit them prior to the reregistration CME reporting time.

Reports at the appropriate time and/or questions prior to that time may be addressed to:

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—Cole, D.R., et al.: Antimicrob. Ag. Chemother. 11(6):1033-1035 (June) 1977.

Tissue penetration is essential to therapeutic efficacy; however, specific tissue levels have not been directly correlated with specific therapeutic results.

Before prescribing, see complete prescribing information in SK&F literature or PDR. The following is a brief summary.

Indications: Ancef® (sterile cefazolin sodium, SK&F) is indicated in the treatment of the following serious infections due to susceptible organisms:

Respiratory tract infections due to Streptococcus pneumoniae (formerly D. pneumoniae), Klebsiella species, Hemophilus influenzae, Staphylococcus aureus (penicillin-sensitive and penicillin-resistant), and group A beta-hemolytic streptococci.

Injectable benzathine penicillin is considered to be the drug of choice in treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. 'Ancef' is effective in the eradication of streptococci from the nasopharynx; however, data establishing the efficacy of 'Ancef' in the subsequent prevention of rheumatic fever are not available at present.

Urinary tract infections due to Escherichia coli, Proteus mirabilis, Klebsiella species, and some strains of enterobacter and enterococci.

Skin structure infections due to Staphylococcus aureus (penicillin-sensitive and penicillin-resistant), group A beta-hemolytic streptococci and other strains of streptococci.

Biliary tract infections due to Escherichia coli, various strains of streptococci, Proteus mirabilis, Klebsiella species and Staphylococcus aureus.

Bone and joint infections due to Staphylococcus aureus.

Genital infections (i.e., prostatitis, epididymitis) due to Escherichia coli, Proteus mirabilis, Klebsiella species, and some strains of enterococci.

Septicemia due to Streptococcus pneumoniae (formerly D. pneumoniae), Staphylococcus aureus (penicillin-sensitive and penicillin-resistant), Proteus mirabilis, Escherichia coli, and Klebsiella species.

Endocarditis due to Staphylococcus aureus (penicillin-sensitive and penicillin-resistant) and group A beta-hemolytic streptococci.

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to 'Ancef'.

Contraindications: ANCEF (STERILE CEFAZOLIN SODIUM, SK&F) IS CONTRAINDICATED IN PATIENTS WITH KNOWN ALLERGY TO THE CEPHALOSPORIN GROUP OF ANTIBIOTICS.

Warnings: BEFORE CEFAZOLIN THERAPY IS INSTITUTED, CAREFUL INQUIRY SHOULD BE MADE CONCERNING PREVIOUS HYPERSENSITIVITY REACTIONS TO CEPHALOSPORINS AND PENICILLIN. CEPHALOSPORIN C DERIVATIVES SHOULD BE GIVEN CAUTIOUSLY IN PENICILLIN-SENSITIVE PATIENTS.

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Any patient who has demonstrated some form of allergy, particularly to drugs, should receive antibiotics cautiously. No exception should be made with regard to 'Ancef'.

Usage in Pregnancy: Safety of this product for use during pregnancy has not been established.

Usage in Infants: Safety for use in prematures and infants under 1 month of age has not been established.

Precautions: Prolonged use of 'Ancef' may result in the overgrowth of nonsusceptible organisms. Careful clinical observation of the patient is essential.

When 'Ancef' is administered to patients with low urinary output because of impaired renal function, lower daily dosage is required (see dosage instructions). A false positive reaction for glucose in the urine of patients on 'Ancef' has occurred with Clinitest® tablets solution.

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WANTED: FAMILY PHYSICIAN — to join two Board Certified Family Physicians and a Certified Physician Assistant in a Southwestern Minnesota community of 4,500. Please contact either Doctors Dokken or Johnson at the Windom Clinic, Ltd., 1041 3rd Avenue, Windom, Minnesota 56101 or phone AC507-831-2550.

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WANTED: PHYSICIAN to sponsor and train a nurse through a one-year Nurse Practitioner Program. Write: Carolyn Torkelson, 611 White Bear Ave., St. Paul, MN 55106 Phone (612) 774-3639.

(Continued on Page 686)

(Continued from page 685)

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APPLICATIONS WELCOMED from board-qualified or certified radiologists, large teaching hospital, upper Midwest; university affiliation, subspecialty training in pediatrics and/or therapy desirable. Box 529, MINNESOTA MEDICINE, 101 E. 5th St., St. Paul 55101.

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Annual Subscription—$12.00. Single copies—$1.50. Foreign and Canadian—$14.00.

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President's Letter

Season of Good Will

The season of good will is upon us. In that spirit, may I extend to all members greetings with the hope that each of you may enjoy the season with the full depth and dimension of his or her own significant inner feelings, and each of you will in turn enjoy the satisfaction of helping fellow humans to achieve fulfillment of their basic drives of brotherhood, altruism, and understanding.

It is a time to set aside the bitterness and acrimony of internal and external debate and project the love of humanity and respect of the individual. This, after all, was the fundamental, motivating force that attracted each of us to the field of medicine. We (more appropriately I) get distracted by all those alligators in the swamp we originally intended to do something about. In that sense, this is also the season of reason.

It is the season to recall the enormous rewards that occur to each of us from time to time in our efforts to ease disease. Who among us has not experienced the ultimate height of expressed appreciation from a grateful patient for our efforts, even in a losing cause. Many times this grateful patient relates an anecdote in which we helped him or her more than we understood ourselves. That alone is sometimes the ultimate reward which makes all the other frustrations of a lifetime seem tolerable and alone is sufficient inspiration to accept and participate in any and all future dilemmas.

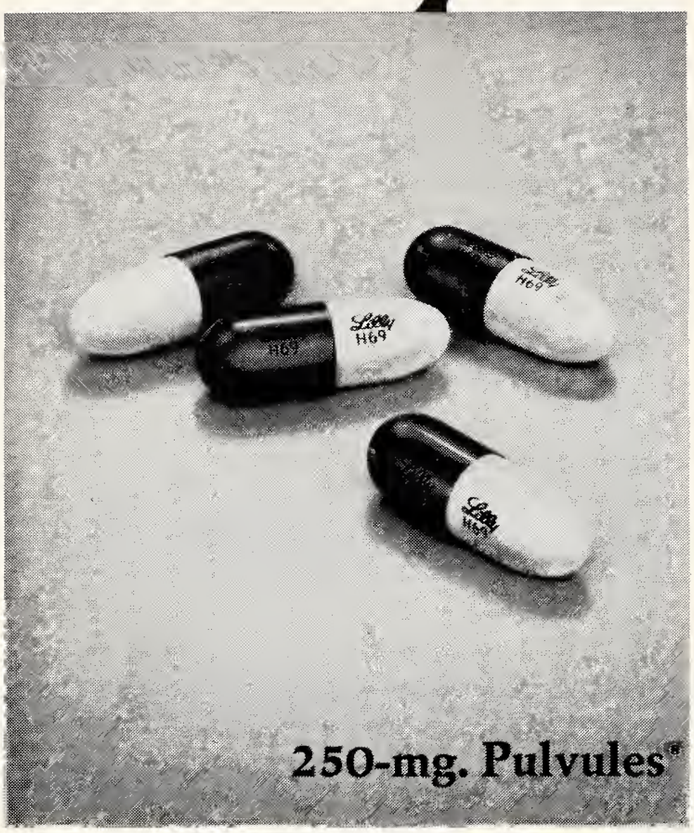
Respected colleagues, we strive in the most fundamental of all fields of human endeavor. Our precepts of conduct and inquiry are basic and noble. Our efforts are beneficial to mankind. This we know and take heart in. We shall continue to hold our heads high, firm in the knowledge that our motives are sincere, our capabilities considerable, our self esteem approachable, and our respect for the human body, its intellect and ideal, profound. Protection of our fellowman from the ravages of disease or abuse remains our basic commitment. In this season of good will, we tell people that we care and will continue to care and that we as a profession stand ready to give of ourselves and our skills to whomever shall need or desire the capabilities we possess.

May this Spirit of Good Will prevail now and forever for all of us.

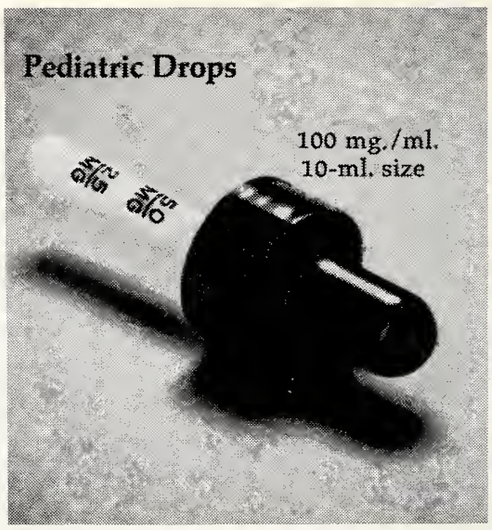
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Case Report

Lipomatosis Ileocecal Valve

W. S. MIJARES, M.D., FACS* and ANDY RUTH, B.A.*†

Lipomatosis of the ileocecal valve is a rare condition that presents a diagnostic challenge. The symptoms and signs are often vague, consisting of discomfort or gas and sometimes they are totally absent, except barium enema findings of suspicious filling defect or polyp. The pathologic finding is a non-encapsulated diffuse fatty infiltration of the ileocecal valve, but could also be non-specific. An experienced Colonoscopist may aid in the diagnosis. Often only an exploratory laparotomy could resolve the diagnosis. If the patient is symptomatic, adequate biopsy or resection of the ileocecal valve is recommended. A review of two recent cases in Fairmont Community Hospital have been presented as well as comments from literature of this syndrome. Excision of these lesions was done successfully and the patients have had a benign post-op course.

LIPOMATOSIS OF THE ileocecal valve is a relatively rare condition. It consists of submucosal infiltration of fat into the region of the ileocecal valve, often producing a protrusion of mucosa into the lumen of the valve. The condition is often asymptomatic and perhaps 50% of the time it is found only as a persistent filling defect of the cecum during routine barium enema. This finally produces a difficult differential diagnosis, usually resolved only by laparotomy. Two cases have been encountered lately in the Fairmont Community Hospital and are reported here for review.

Case Reports

Case 1

A 72-year-old white female, married, obese type, was admitted for general physical examination workup. The chief complaint was her abdomen felt gassy on and off for the past eight to 10 years. Patient had a routine upper GI and barium enema with the findings of a large polyp about 3cm. in diameter at the ileocecal area. This was further demonstrated on air contrast colon x-ray, interpreted as possible carcinoma of polypoid type tumor because of the broad base, size and age of the patient.

History

Cholecystectomy in 1967.

Physical Examination

Otherwise negative.

Procedure done was exploratory laparotomy. During this exploration, a cecotomy was done and a polypoid mass with broad base was noted in the cecum, with a smooth surface and soft consistency without ulceration or bleeding noted. Because of the benign appearance of this area, an excision of this polypoid mass was done and the report was lipomatosis of ileocecal valve. The postop course was benign and uneventful.

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Case 2

A 66-year-old white female, married, moderately obese type, complained of feeling of gassiness, belching, otherwise asymptomatic.

Past History

Cholecystectomy in 1973. A polypectomy of villus adenoma of the rectum was done in 1972.

Family History

Mother had carcinoma of the colon that was successfully treated.

Physical Examination

Essentially normal. Pap smear negative, proctosigmoidoscopy negative. Chest Xray normal. Colon - barium enema showed constant filling defect in repeated colon Xray with contrast at the area of the cecum. This defect is difficult to rule out carcinoma and because of the history of villus adenoma removed in the rectum and also the family history, an exploratory laparotomy was done and because of the mass that was felt in the cecum, an ileocolectomy was done. The pathology report was lipomatosis, ileocecal valve. Patient had uneventful recovery following this procedure. The pathology report — lipomatosis ileocecal valve. The valve is edematous and congested. Its thickness measures 2.1 cm. and in addition, two small polyps were noted in the ileocecal valves. No malignancy seen.

Discussion of Case and Literature Review

It was barely 36 years ago when Strombeck and subsequently, Golden,[1] brought to attention the radiologic defect in the cecum due to ileocecal valve enlargement. Since then, several articles were written about "ileocecal valve syndrome", or lipomatosis with several etiologies, signs, symptoms and approaches to the management.

Our patients were both females, obese type, in the ages of 72 and 66 respectively. Other studies have reported a female to male ratio of two to one.[3,4,5,7] The disease is most often found in women between the ages

of 50 and 70,[7] although 19 cases surveyed by Perkel and Troat found ages ranging from 21 to 83.[5] The average of their cases was 62. The syndrome is rare before the age of 40.

Pathologically the lesion appears as a nonencapsulated diffuse fatty infiltration of the ileocecal valve. Because of the absence of a capsule, it is more accurately classified as a lipohyperplasia rather than a lipoma and is not a true neoplasm.[4] While submucous lipomas of the GI tract are quite common, lipomatosis of the ileocecal valve is indeed a rare finding. The underlying mucosa is normal and generally intact. Occasionally edema, hemorrhage and inflammatory changes have been observed.

Enlargement of the ileocecal valve and/or polypoid protrusion of mucosa into the lumen may account for the clinical manifestations. Colicky pain may be produced when peristalsis is stimulated by the protruding polypoid mass. Intermittent intussusception may occur, producing bowel obstruction with abdominal tenderness, distention and obstipation. Vomiting, diarrhea and blood in the stool are also common. It is interesting that the lesion may be completely asymptomatic in half the patients found to have roentgenologic evidence of ileocecal mass.

The origin of the submucosal infiltration of fat has never been determined. Edema and pouting of the lips of the ileocecal valve were found quite commonly in pathological specimens of patients resected for regional enteritis by Golden.[1] Boquist et al. felt that peristaltic movements in the intestines may be a factor.[4] Castleman related one case to chronic intussusception, but also found hypertrophied ileocecal valves removed from patients with no symptoms of chronic intussusception.[2] Whether recurrent intussusception or an inflammatory process evolved, the development of the lipomatosis may be obscure for some time.

Whatever the cause, the finding of a constant filling defect near the ileocecal valve on barium Xray produces a diagnostic problem. Some feel that roentgenographic evidence of a symmetrical, well-defined radiolucent filling defect in the cecum that is asymptomatic, is highly suggestive of a lipoma.[8] The incidence of malignant tumors in this region is much too high in persons over the age of 40 to be casually ruled out. These tumors take on the utmost of significance. Indeed, only histologic sections provide definitive diagnosis. With the advance of colonoscopy, more lesions found on Xray can be biopsied for management.[9] Laparotomy with cecotomy and excisional biopsy is still preferred for larger, more irregular masses and those producing symptoms.[6] The difficulty of ruling out malignancies, thus makes the invasive procedure the conservative form of management.

Summary

Two cases of lipomatosis of ileocecal valve have been presented as an incidental finding during routine diagnostic workup. Because it was found in elderly persons, it causes a diagnostic problem of ruling out malignancy. In previous reports, either a cecotomy and excision biopsy of lesion or ileocolectomy was done. A report from a Scandinavian literature of one case claims that colonoscopic biopsy was done and followed up successfully. However, others suggested that in symptomatic cases or where it is difficult to rule out malignancy because of the size and appearance of the lesion as well as previous past history and family history, an exploratory laparotomy with total excision of lesion is desirable.

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Occlusion of the Superficial Palmar Arch

Diagnosis and Treatment

CHRIS P. TOUNTAS, M.D.,* TOM JONES, M.D.,† DOROTHY VAN DYKE, N.M.T.†

Six cases of ulnar artery thromboses were evaluated with Allen's Test, and radionuclide angiograpy. All had their thromboses resected, two had attempted vein grafts. All patients were improved after surgery.

SEVERAL AUTHORS have described thrombosis of the superficial arterial palmar arch.[1–7,10] We have treated six cases of ulnar artery thromboses and here review our experience utilizing clinical findings and radionuclide angiography.

The patient usually complains of pain and/or a palpable mass of the proximal hypothenar eminence, cold intolerance of the ring and little fingers, and hypesthesia. In many cases, trauma to the hypothenar area may be causative.[8–9]

Physical findings of ulnar artery thrombosis are: palpable mass, ischemic ring and little fingers, ulcerations and a positive Allen's test.[15] Allen's test was modified and is performed by first having the examiner simultaneously compress the radial and ulnar arteries. Then the patient squeezes the blood out of the hand by opening and closing the fingers several times. With the fingers partially extended, the ulnar artery is released, and the distribution of capillary filling in the hand is noted. The blanching is repeated and the opposite artery is released. Failure of skin color to return promptly with the radial artery occluded and the ulnar artery released indicates absence of ulnar artery flow. The patient should be cautioned about hyperextending the fingers during the Allen's test since excess skin tension of the palmar skin will delay blood flow and yield a false positive.[19] The same procedure can be applied to the fingers and may be helpful in evaluating digital artery thrombosis.

In some cases it is clinically difficult to diagnose a concurrent ulnar neuritis when there is a complaint of numbness. The finding of hypersensitivity or radiating paresthesia when tapping the ulnar nerve (Tinel's sign) at the wrist as it courses with the artery through the ulnar tunnel (canal of Guyon) makes such simultaneous entrapment suspect. The differential diagnosis of ulnar artery thrombosis includes aneurysm of the ulnar artery, Raynaud's phenomenon, systemic lupus erythematous, periarteritis, arteriosclerosis and thoracic outlet syndrome.

We have also used radionuclide angiography[16] and nerve conduction studies for objective preoperative evaluation. Invasive angiography has not been routinely used (Figure 3 and 4). Flow studies utilizing Technetium 99m are safe, non-invasive, reproducible and with no risk to the patient. The patient is seated with hands placed palm down on the face of an Anger scintillation camera (Dynacamera 2 C). Care is taken to include the wrist and fingers are spread apart at least 0.5 cm.

Approximately 15m Ci of 99mTc pertechnetate is injected into either antecubital vein. The pertechnetate is injected in a "tight" bolus. Syringe, tubing and 3-way stopcock are evaluated for residual radioactivity to determine the exact dose administered. The hand flow of 99mTc is recorded on a 8x10 Dunn Multiimager. A fine focus low energy collimator is used. Serial sequential 1, 3 and 5 second images are recorded and viewed to determine if other sequential imaging is necessary. A composite image of 15 or 30

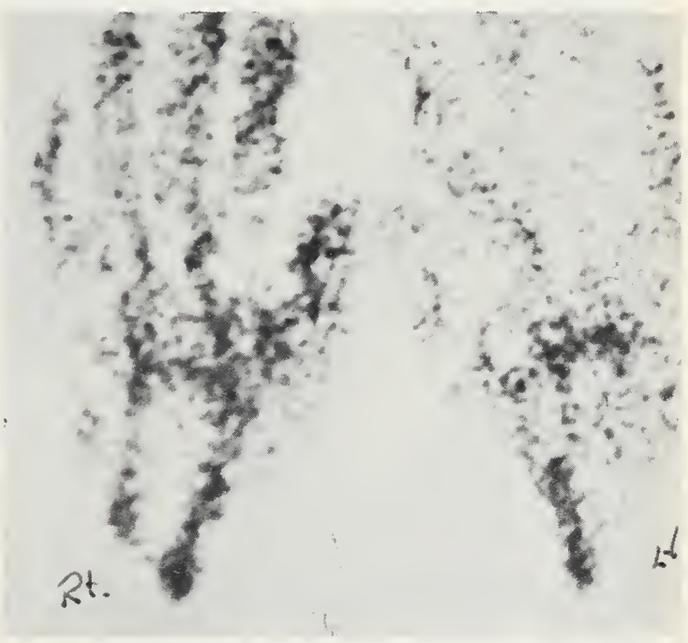


Fig. 1 — (Right) Normal radionuclide angiogram. (Left) Abnormal with ulnar artery occlusion. Note decreased activity in fingers.

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See editorial, page 704.



Fig. 2 — Thrombosed ulnar artery.



Fig. 3 — Left normal arteriogram.



Fig. 4 — Right — abnormal arteriogram. Occluded ulnar artery.

seconds and composite equilibrium at 5, 15 and 30 minutes are also obtained.

The radial and ulnar artery complexes representing both deep and superficial arterial arches can be visualized and evaluated (Figure 1). The resolution is not sufficient to visualize the digital arteries but overall perfusion of each digit can be evaluated. Localized, diminished radioactivity implies vaso-occlusive or vasospastic disease especially if it is asymmetric.

Delay of greater than five seconds in the appearance of 99mTc at the wrist implied proximal occlusion or spastic disease. Several patients with disparity of up to 15 seconds with no clinical or angiographic evidence of proximal occlusive disease have been observed.

Another non-invasive technique utilizes the ultrasonic flow detector. This was not used in our series but it is recommended because of portability and instantaneous response.

Six patients (Table 1), all males, between the ages of 23 and 58 were diagnosed as having thrombosis of the ulnar artery. Three patients gave definite histories of trauma and the remaining three had jobs involving repetitive use of the hands.

Each patient complained of tenderness at the hypothenar eminence and all but one had a positive Allen's test. Five patients complained, or were noted to have discoloration of the tips of the ring or little fingers. One of these had an ulceration on the tip of the ring finger. Each had varying degrees of subjective numbness of the ring and little fingers. Two patients were temporarily relieved with sympathetic blocks.

All patients were operated upon. Two cases (nos. four and six) did not have preoperative angiography because the thrombosis was not suspected in number four and because the procedure was unavailable to number six.

Patient four had a negative Allen's test and a painless preoperative mass which was not felt to be vascular.

At surgery, the thrombotic segments varying in length and extending two to six cm. above the wrist were resected (Figure 2). Distally, they involved the ulnar digital artery, common digital artery to the ring and little and/or middle and ring fingers. Thrombosed digital arteries were not resected.

Two vein grafts (Figure 5) were inserted from a reversed dorsal hand vein with interrupted 9-0 nylon, utilizing 2 x magnification. The vein grafts became occluded as evidenced by one postoperative scan and a persistently positive Allen's test in both cases. Thrombectomy was not possible because of well organized thrombi.

Postoperatively, all patients felt improved by indicating there was no pain and less sensitivity to cold.

TABLE 2

Intravenous Radionuclide Angiography of the Hands

Advantages	Limitations
1. Non-invasive, simple	1. Restricted imaging area
2. Can be performed in any isotope department with scintillation camera	2. Does not resolve small arteries
3. No morbidity	3. Does not replace contrast arteriography
4. Detects vasospastic or vaso-occlusive disease of the hands	4. Anatomic variations can limit interpretation
5. Computer analysis possible	5. Difficult to delineate immediate postoperative surgery because of reactive hyperemia

TABLE 1

Case	Age	Occupation	Dominant Hand	Trauma	History	Pre Op Allen's Test	Pre Op Tc99m Scan	Treatment	Post Op Results
1	45	Construction	No	No	Cardiac cath Smoker	+	+(L)	Sympathetic block Resection	Improved
2	58	Truck Driver	Yes	Changing gears	—	+	+(R)	Resection and vein graft	Improved Occluded graft + Scan + Allen's test
3	23	Mechanic's Helper	Yes	No	Smoker	+	+(R)	Resection	Improved
4	35	Assembly Worker	Yes	No	—	Neg.	None (L)	Resection	Improved
5	46	Sheet Metal Worker	Yes	Plate fell on hand	Smoker Ulceration	+	+ Bilateral	Sympathetic block Resection	Improved Ulceration healed
6	42	Maintenance Worker	Yes	Struck wrench	Smoker	+	None (R)	Resection and vein graft	Improved Occluded graft + Allen's test



Fig. 5 — Grafted ulnar artery.

Discussion

The unique position of the ulnar artery as it enters the palm makes it especially labile to direct trauma.

The ulnar artery, accompanied by the nerve, leaves the forearm and passes beneath the volar carpal ligament to enter the palm. Passing through a tunnel (Guyon's canal), it lies on the transverse carpal ligament, bounded anteriorly by skin, subcutaneous tissue and palmaris brevis muscle, and ulnarly by the pisiform. In most cases, the ulnar artery continues to form the superficial arch by joining with the superficial branch of the radial artery and lies beneath the palmar fascia and over the flexor digitorum superficialis tendons.

The superficial arterial arch usually branches to supply the ulnar side of the little finger and to give three common digital arteries to opposing surfaces of the fingers. There are, however, several variations[12,13] in the formation of the superficial arch, in which the ulnar and radial arteries vary in their contribution. In addition, the median artery may contribute to the formation of the palmar arch and may even replace the radial artery.

In one series[17] of 100 normal hands, circulation was studied with the Allen's test and ultrasonically with a Doppler flow meter. In most cases collateral circulation would maintain digital viability but 9% of the hands depended on the ulnar artery and 6% on the radial. Allen's test did not correlate all of the findings of the Doppler flow meter.

Another study[18] of seventy volunteers (140 hands) utilizing the Doppler flow meter showed 17 hands with radial dominant circulation. Twenty-five hands showed ulnar artery dominant circulation with incomplete arches and of these, twenty had no detectible circulation with ulnar artery compression.

Resection alone, on our series, seems to have worked as well as grafting. The latter is attractive as a possible means of restoring anatomical continuity and flow from the usually predominant arterial supply to the superficial palmar arch. The effect attributed to resection is a local sympathectomy. Cervical sympathectomy has been reported[20] as a treatment for occluded ulnar artery, but in our opinion, the operative risk and postoperative complications may not be justified when the thrombosis can be treated peripherally. Most reports advocate resection alone, but with microsurgical techniques we feel grafting and the hemodynamics of the palmar arches merit further investigation.

Acknowledgment

The authors express their sincere appreciation to Dr. Richard Scott, Chief Pathologist, Greenville Hospital, Greenville, Pa. for his assistance.

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6-20. Will be found on Page 724.

Rheumatology Corner

Synovial Fluid Analysis

A Simple and Useful Tool in Diagnosis

PAUL H. WAYTZ, M.D.*

ARTHRITIS CAN RESULT in the increase in volume of synovial fluid. A precise diagnosis of gout, pseudogout, or septic arthritis can be made by an appropriate study of the fluid. A diagnosis of osteoarthritis, rheumatoid arthritis, or rheumatoid variant disease and traumatic arthritis can be supported by synovial fluid analysis.

Normal fluid is clear, pale yellow, and highly viscous and does not clot upon standing. In osteoarthritis, synovial fluid retains its normal color, clarity, and high viscosity. In rheumatoid arthritis and other forms of inflammatory synovitis, turbid, thin watery fluid is found. It will not string out when a drop is stretched between two fingers. Synovial fluid of acute gout or pseudogout can be cloudy secondary to an elevated white count and the presence of crystals. Septic arthritis results in thick purulent fluid which may contain fibrin clots. Post traumatic effusions vary in appearance from xanthochromic to pink to grossly bloody depending on the interval between bleeding and aspiration.

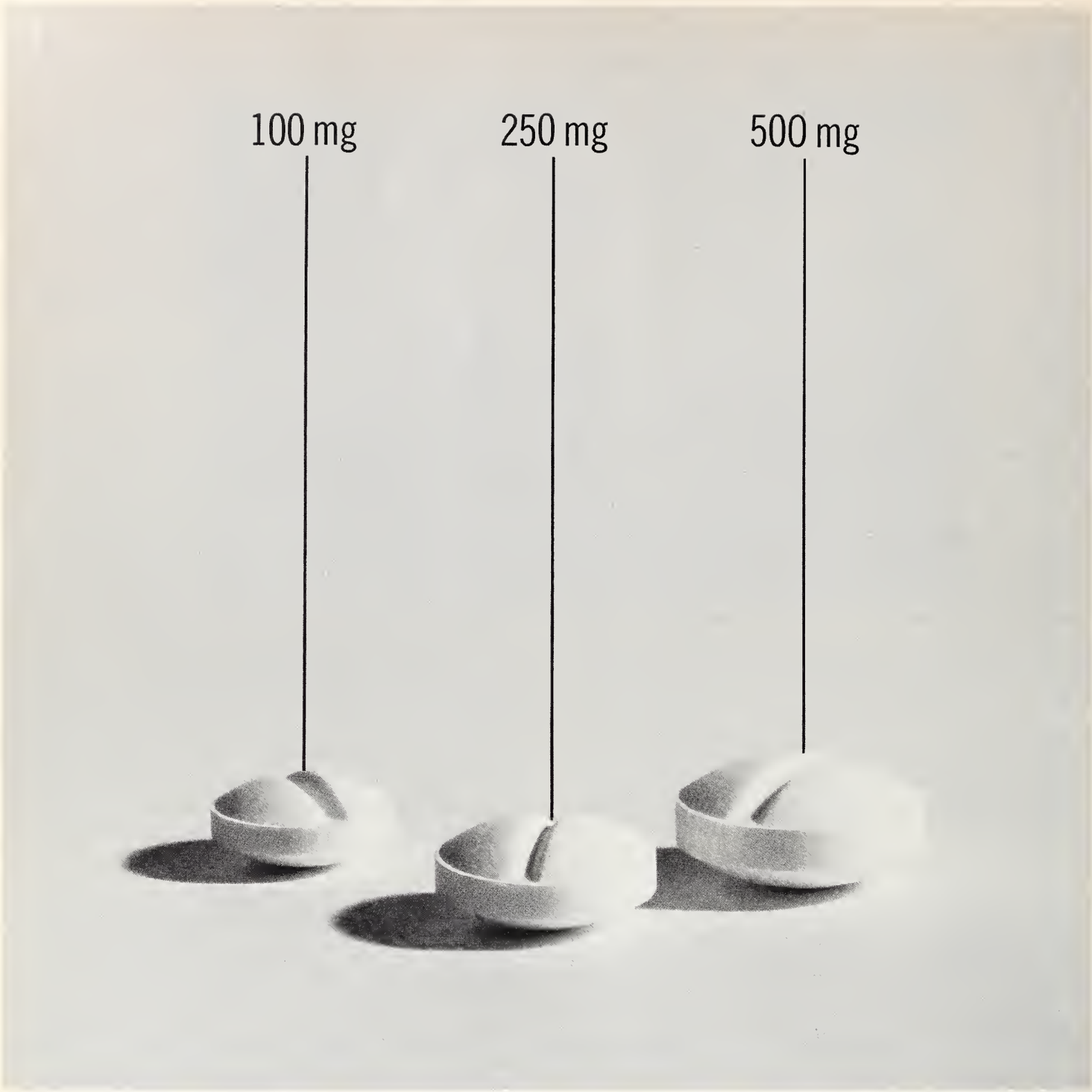
Joint fluid is collected in nonoxalated tubes with anticoagulant for microscopic studies. EDTA or heparinized tubes are excellent. Cultures and gram stains are important if joint sepsis is suspected. Finding crystals of monosodium urate or calcium pyrophosphate document the diagnosis of gout or pseudogout. A polarizing microscope will demonstrate them best, but a plain light microscope will frequently suffice. Occasionally, crystals will appear more brilliantly when fluid is left overnight in the refrigerator.

A normal synovial fluid count reveals no red cells and less than 200 white cells per millimeter. The count is done with a routine white cell counting chamber and normal saline. Hemorrhagic fluid suggests bleeding diathesis, trauma (or a traumatic tap), or pigmented villonodular synovitis. A white cell count of greater than 2000/mm^3 separates inflammatory from noninflammatory effusions. Newsprint can't be read through fluid with greater than 2000 cells. Active

*Section of Rheumatology, Minneapolis Veterans Hospital, Minneapolis, Minnesota.

TABLE
Synovial Fluid Analysis

Disease	Appearance	Viscosity	WBC/mm^3 % PMN's	Glucose synovial/ serum difference	Comments
Normal	Straw, clear	High	< 200 < 25%	10%	
Osteoarthritis	Yellow, clear	High	1000 < 25%	10%	Occasional cartilage debris
Traumatic arthritis	Clear, xantho-chromic or bloody	High	< 2000 < 25%	10%	Occasional cartilage debris; Few to many RBCs
Rheumatic fever	Yellow, slightly cloudy	Mod.	10,000-12,000 50%	10%	
Systemic Lupus Erythematosus	Yellow, slightly cloudy	High	5000 < 25%	10%	Occasional LE cells
Pseudogout	Yellow, slightly cloudy	Low (if acute)	1000-10,000 25-75%	10%	Calcium pyorphosphate crystals; (Weak + birefringence)
Gout	Yellow/white, cloudy	Low	10,000-15,000 60-70%	10%	Sodium urate crystals; (Strong — birefringence); Often markedly WBC count
Rheumatoid arthritis	Yellow/green, cloudy	Low	10,000-20,000 60-75%	30%	Low CH_{50}; WBC often higher; Glucose often lower
Rheumatoid Variants	Yellow, slightly cloudy	Mod.	< 10,000 < 50%	10%	Reiter's: Elevated CH_{50}
Septic arthritis	Gray, bloody, with clots	Low	80,000-200,000 75-95%	50%	Often very low glucose; + Gram's stain in 65%
Tuberculous arthritis	Yellow, cloudy	Low	25,000 50-60%	50%	+ AFB culture; synovial biopsy may be necessary



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rheumatoid arthritis and acute gout are associated with white counts usually greater than 10,000. Other connective tissue diseases such as systemic lupus erythematosus or rheumatoid variants usually have counts less than 10,000. Counts of 50,000 or greater are assumed to be the result of infection until proven otherwise.

Normal and non-inflammatory fluids show a predominance of mononuclear leukocytes rather than polys, with polys usually predominating in inflammatory fluids.

The finding of needle shaped, negative birefringent crystals of sodium monourate documents gout, while rectangular weakly positive birefringent crystals of calcium pyrophosphate document pseudogout. During acute attacks, crystals are usually demonstrated within leukocytes. Crystals of previously injected corticosteroids can assume a variety of shapes and can be confused with the crystals of gout and pseudogout.

Glucose concentration in normal fluid differs by less than 10% of a simultaneously drawn serum sample. Synovial fluid glucose may be 50% or less in an infected joint. Rheumatoid synovial fluid glucose is usually 30% less than the serum.

Hemolytic complement determinations can occasionally be helpful but do not belong to the routine evaluation of fluid. The levels should be correlated with the protein concentration of the synovial fluid. In severe rheumatoid arthritis, synovial fluid complement can be low and suggestive of immune complex disease. In Reiter's syndrome, complement was found to be elevated, but further studies proved it to be normal when correlated with the synovial fluid protein. Special caution should be taken with this test as levels will diminish if not run immediately or frozen at -70°C.

Rheumatoid factor can be positive in joint fluid prior to its appearance in the serum and support an early diagnosis of rheumatoid arthritis. False positive values have been noted.

The above tests are helpful in the early diagnosis when correlated with the clinical findings and history. The physician is encouraged to aspirate joints for these studies if fluid is present and the diagnosis is indeterminate.

Ye'll Have No Pockets in Your Shroud

Brother Ceasarius was a loyal member of a Catholic teaching order known as The Brothers of the Christian Schools. Straight from Old Ireland, he had a bit of the bog in his voice and a bit of the humor in his heart. In the 1930s he taught us French and chemistry — an unlikely combination. A member of both old and new schools of pedagogy, he was aware that the best of teaching was by inspiration, but he was old school in the sense of dedication to classical principles of repetition. So, in his rich County Kerry accent, he drilled us in French grammar, sentence structure and pronunciation. At the same time he inspired us with his many aphorisms, one of which has remained in my memory for all these years. That was his admonition, "Keep in mind, lads, ye'll have no pockets in your shroud."

The Student Loan Fund of the Foundation of the Minnesota Medical Association may well owe a debt to Brother Ceasarius. Those of us who struggled through medical school with some of the handicaps of the depression remember the difficulties. It is even tougher for the medical students of today, for inflation has inevitably caused an enormous surge in the cost of their training. These youngsters are aided in significant ways by the excellent work of our Medical Association, work that is possible only because you are aware of your obligation to the coming generation of physicians, that you have generously supported the Foundation, which has been at their right hand when they need assistance, and that you, like Brother Ceasarius, keep in mind that "ye'll have no pockets in your shroud." Give generously, give promptly, give cheerfully. The address is Foundation of the Minnesota Medical Association, Student Loan Fund, 101 E. Fifth Street, St. Paul, Minnesota 55101.

Incidentally, my French-speaking daughter informs me that when I lapse into my schoolboy efforts at that language, I do so with a bit of a brogue.

John J. Regan, Sr., M.D.
Chairman

Editorials

Occlusion of the Superficial Palmar Arch

ALTHOUGH AUTHORS Tountas, Jones, and Van Dyke*were not successful in restoring flood flow in the cases wherein reversed vein grafts were used, nevertheless, the patient's symptoms were at least partially alleviated.

Micro vascular techniques are being applied in practically all fields of surgery and hand surgeons have been in the forefront especially with reimplantation of digits, transplantation of digits (i.e. toe to hand), and the use of composite grafts. Reconstruction of the volar arches is a logical extension of this but it would seem the number of cases wherein it would be necessary would be few because of the extensive collateralization in the hand.

Harrison H. Farley, M.D.
Minneapolis, Minnesota

*See page 697.

Temporomandibular Joint Arthrography

THE AUTHOR OF THIS paper has given an excellent account of TMJ pain-dysfunction syndrome and is convincing of the value of arthrography in delineating the anatomic derangement involving the TMJ. Arthrography of the TMJs is valuable in two ways. First, it is an excellent method to demonstrate normal anatomy in vivo as well as normal dynamic function of the components of the TMJ. Secondly, dysfunction of the components of the TMJ, primarily involving the meniscus and its attachments can be quite confidently examined.

The technique demands meticulous attention and it is obvious that experience will perfect this technique. This examination should be attempted only after thorough familiarity with the anatomy, the normal variations, and knowledge of the anticipated abnormalities.

Arthrography of the TMJ, therefore, appears valuable in diagnosing internal derangements of the TMJ. Not only is it valuable in diagnosing abnormalities, but a negative examination is also a valuable examination in the differential diagnosis of TMJ pain-dysfunction which has numerous etiologies and of which meniscal abnormalities are a major problem.

C. Wiens, M.D.
Minneapolis, Minnesota

*See page 645.

COVER PHOTOGRAPH

"Minnesota Wheat for Export"

Dr. Bruce Nydahl, internist practicing in Southdale, took the cover photograph during the April, 1974, annual meeting of the Minnesota Medical Association in Duluth. He had some free time after the seminars and took a drive around the harbor. The ship is a foreign freighter, and probably one of the first into the Duluth harbor. The editors call attention to the wheat growing along the peer on the one side of the ship.

Dr. Nydahl is a University of Minnesota Medical School graduate and presently is a Clinical Assistant in the Department of Medicine at the University. He is married and has three children.

The December, 1974, and December, 1977, issues of MINNESOTA MEDICINE have slides on their covers taken also by Dr. Nydahl.

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Letter to the Editor

Dear Editors:

Cost Containment

I have read Dr. Walter McClure's article in the "Minnesota Medicine", April 1978 issue.* I commend him on the depth of his study and for the thoughtfulness of the conclusions that he presented. Being a physician, I could of course expect to be defensive, and I am particularly when people begin to complain about the cost of medical care. Individual fees I know have been increasing, but I doubt that they have increased out of proportion. I know that as I compare my income for the past several years, my purchasing power has not been increasing. I laughingly tell people that I permit the federal government to determine my fees in that my fee for general office calls, is pegged to the price of the postage stamp. When I began practice, we were using a three cent stamp, and the regular office call was about $3.00. Today the postage stamp is 13c and my general office call is about $13.00.

I think the effect of third parties paying medical bills changes the picture considerably. The more distant the patient is from paying the bill, the more demanding he becomes for services. An illustration, I think, is the demands that are made by people on public assistance for medical attention for rather minor complaints that might otherwise be handled by home remedies. I think of the number of people coming in for general health evaluations who are receiving public assistance and have no presenting complaint. Or the number of people who say, well let's go ahead and get this or that as the case might be, the insurance company is going to pay for it anyway, and of course, the person who is going to need a rather extensive workup in order to properly evaluate his symptom complex and requests that he be in the hospital so his insurance will pay for the necessary workup. With these thoughts in mind I can't help but think that some sort of deductible program would be desirable, although I know the public at large seems to be more interested in first dollar coverage.

I cannot see the government getting into the picture any more than they are. One would think that the Medicare, Medicaid problems would have taught them a lesson, that is that by making medical care so-called free to the individual, certainly increases the demands of the individual and hence the cost. I do not think that services provided by the government for the most part at least are inexpensive, what I mean to say is that I think other agencies probably can provide similar services at less overhead. The HMO concept does have its good points and where it is in operation too often I think they syphon off the healthy working individuals leaving the unemployed, the elderly and such, which creates an artificial cost factor that I do not think is properly evaluated when teams attempt to evaluate the relative cost of HMOs versus fee for services. This I have no way of proving; it is just the impression that I get as I look at various statistics.

The so-called Cost Containment Program that is being instituted by the federal government aimed at least for now at hospitals, I think is perhaps unjust. I recently reviewed some of the costs in the operation of our office here for a period of ten years and just what we choose to call building occupancy, (utilities, janitor service, insurance and so forth) has more than doubled in ten years which was I admit a bit surprising to me. What I would say is that if the health industry is to have a cost containment they also must have a lid on the other end, that is what they pay for goods and services must have some sort of a limit as well.

As we look at various European systems which primarily put a limit on that which can be spent, this only denies people services, and I do not think that the American public would stand still for such a program. We are all too used to getting what we need and want right now without having to wait for it.

Again the analysis of Dr. McClure's committee and the conclusions were most interesting, and I thought well conceived.

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*See page 261.

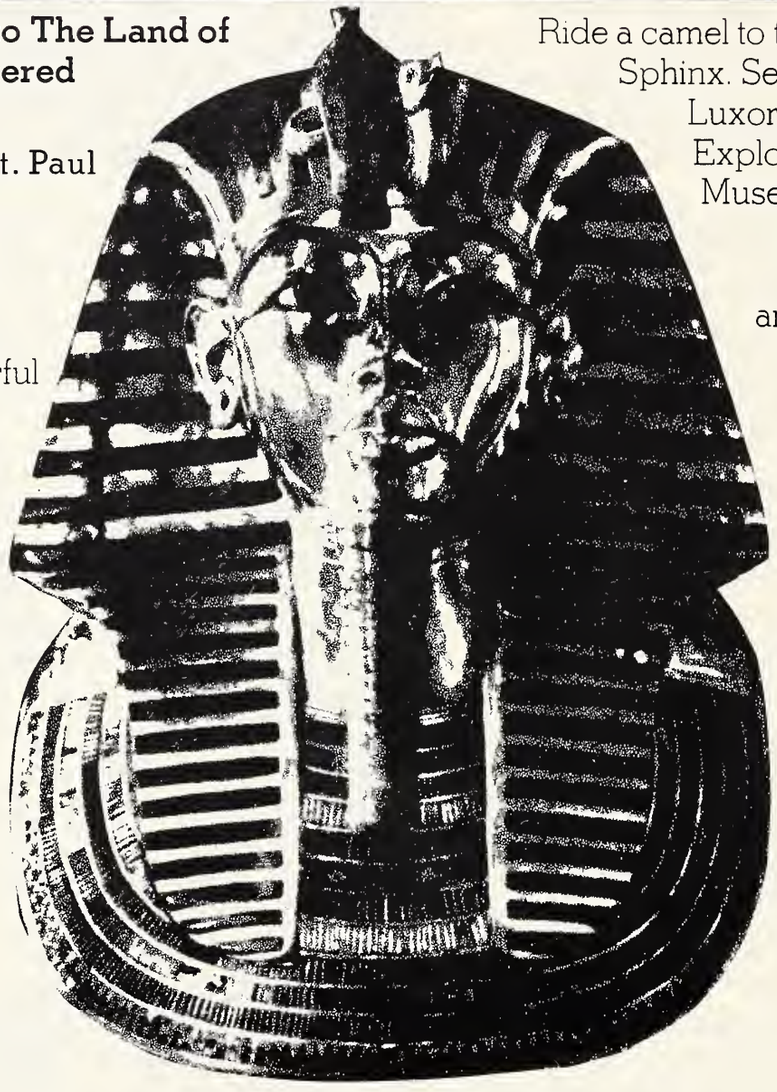
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A question: What would be the impact of a similar program for food and shelter? Set up a system of payment by a third party and I am sure the demand for these products would change just like it has for medicine.

T. M. Hansen, M.D.
Albert Lea, Minnesota

Dear Dr. Hansen:

Thank you for your kind words on my article. You are quite right that "free" care offered under comprehensive insurance induces a spare no expense attitude in patients. It has the same effect upon providers. That is why neither patient nor provider is presently subject to effective market forces. Therefore government and the media are wrong to condemn patients and providers for escalating medical expenditures. Both are doing exactly what the system rewards them to do. If we are to contain costs, we must alter the system, not blame people for acting rationally.

You are also correct in noting that physicians and hospitals face rising operating costs. However, the escalation of medical expenditures far exceeds these "cost push" factors. If only "cost push" factors were at work, then medical expenditures would inflate at roughly the same rate as the rest of the economy. It is the absence of market forces, noted above, which creates the severe additional inflation. And it is the additional inflation that we wish to control.

I would even suggest that the direct unit cost of physicians to society (i.e. their fees and income) is not escalating unreasonably. Rather it is the induced cost of physician activity in hospitals and the cost of hospitals over-equipping themselves to compete for medical staff (and in some cases prestige) that is generating most of the unreasonable escalation. Also the nation is moving toward a surplus of physicians, particularly specialists, beyond anything required or expected to improve health levels. So while the cost of each physician is not unreasonable, the sheer increasing number of them plus the extra costs induced by their activities adds up to excessive expenditure by society. Private initiative to introduce effective market forces would bring both demand and supply into more reasonable balance. Failing that, government will have no recourse but to regulate.

I want to assure you that HMOs and other health care plans do not achieve their savings by creaming off a healthy population. Yes, they presently serve the same employed population served by the Blues and private insurance. But careful studies of comparable populations show that the savings are there even when we adjust for this fact. And they show that the savings persist when Medicare and Medicaid populations are served by these plans.

I believe we can introduce market forces by encouraging reasonably substantial front-end coinsurance in ordinary insurance plans, and by encouraging health care plans where consumers share in the cost of the premium. In this way when consumers choose services or choose a plan they will have an economic reward for choosing efficient providers. The idea is not to drive out all traditional providers and insurers with the new health care plans. Rather competition between the two will be healthy for both. Consumers should have free choice between traditional providers and the new health care plans in a fair marketplace. And physicians should have free choice to engage in traditional practice or in health care plans. (In either arrangement the physician could be reimbursed fee-for-service.) If physicians will endorse this concept of freedom of choice for both patient and physician, healthy competition should grow and the need for regulation would diminish. The physicians of the Twin Cities are already pioneering the way and showing how it can be done. Physicians everywhere should support and emulate them.

Walter McClure, Ph.D.
Director, Health Policy Group
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Special Article

Etiology and Progression of Multiple Sclerosis
A Theory

ROBERT W. SOLL, M.D. PH.D.*

A possible major factor relating to the etiology and progression of multiple sclerosis is presented. The mechanism involved may concern a Shwartzman-like phenomenon triggered by ingestion of allergenic foods as well as intercurrent infections in the body. A delayed type hypersensitivity inflammation against myelin is presumed to be present in the central nervous system.

THE PRECISE PATHOGENETIC mechanism of multiple sclerosis remains unsolved. As will be discussed in this article, the term multiple sclerosis not only denotes the multiple lesions found in the nervous system, but ironically may point out the probable multiplicity of factors contributing to the pathogenetic mechanism of this disease. The purpose of this paper is to attempt to present a concise theory for the etiology of multiple sclerosis. Yet, because of the unusual complex nature of multiple sclerosis, a number of equally significant causative factors may have been omitted.

A variety of clinical and pathological characteristics of multiple sclerosis have been known for years, and these set it apart from most other conditions as a fairly distinct disease entity. Because of the extreme variability of the severity and progression of the neurological involvement in different individuals, however, multiple sclerosis often has been extremely difficult to diagnose. Exceptions occur in those instances in which distinct criteria such as the usual age range, a scattered distribution of the neurological deficits, and relapses and remissions of the clinical course occur. Even then it is necessary to reasonably exclude other disorders that might also explain a particular clinical course. Yet, many patients who ultimately receive an unequivocal diagnosis are able to trace the history of their earlier symptoms retrospectively to years before they became significantly incapacitated. In those instances, diagnosis at a younger age probably would have been impossible due to the mildness of their symptoms and lack of other adequate criteria in their early history. The presence of similar potential early symptoms in individuals who do not progress to classical multiple sclerosis suggests that many people actually may have abortive involvement of their nervous system by a mechanism resembling multiple sclerosis at some point in their lives. Thus, a further speculation might be inferred that multiple sclerosis is possibly a very benign disease for the great majority of the population, and the approximate half million individuals in the United States with confirmed multiple sclerosis could actually be a minority of the real incidence of this disease. Certainly a comparable situation has been noted in many conditions; for example, paralysis with poliomyelitis occurred in a relatively small percentage of the actual number of infected individuals even prior to current immunization practices.[1]

Etiology

The above considerations suggest that the etiology of multiple sclerosis is probably complex, involving several factors that ultimately lead to initiation and progression of multiple sclerosis. Arguments against a viral infection alone being solely responsible for the development and progression of multiple sclerosis are many. A variety of viruses or virus-like particles have been linked directly to multiple sclerosis, some having a more plausible relationship than others. Yet no specific viral infection has been unequivocally associated with all aspects of the disease.

The nearly exclusive confinement of destruction to the cells constituting myelin, the oligodendrocytes, demands a more adequate explanation also if a virus is to be implicated as the only pathogenetic mechanism. Most viral infections of the nervous system cause widespread destruction of various cellular elements, and the neurons themselves seem particularly susceptible to damage by neurotropic viruses.[2] Obviously, neither neuronal cell loss nor total destruction of all cellular elements has been the predominant picture in multiple sclerosis. Finally it would seem reasonable to expect steroid therapy and other forms of immunosuppressive therapy including antilymphoblastic globulin to aggravate multiple sclerosis if the disease were primarily infectious in nature. Rather, most treatments that appear to have shown some beneficial effect in slowing or reversing the disease process have involved

*Neurologist, Waterloo, Iowa.

these types of medications.

On the other hand, a bacterial infection involving the urinary tract or other organ system is very commonly related to a relapse of symptoms and neurological deficits in a multiple sclerosis patient.[3,4] Furthermore, the beneficial effect of steroids often can be suppressed or obliterated by an ongoing bacterial or viral infection within the body. Yet, the remote infection itself probably is not directly related to the origin of the underlying multiple sclerosis.

Shwartzman-Sanarelli Phenomenon

The manner in which bacterial infection may worsen this disease might be explained on the basis of hypersensitive-like reactions comparable to the so-called Shwartzman-Sanarelli phenomenon.[5] In a typical Shwartzman reaction, gram negative endotoxin is injected intradermally into an experimental animal. Several hours later, usually between eight and thirty hours, the animal is rechallenged intravenously with a similar endotoxin or even an antigenically unrelated material. (Of course, the possibility that the latter might be contaminated with endotoxin should be considered.) Shortly thereafter the original skin site becomes hemorrhagic and may become necrotic and ulcerated as well. The pathological mechanism for this reaction still has not been totally resolved but it may have its basis in an animal's delayed hypersensitivity to gram negative endotoxin, or it may be one delayed allergic reaction superimposing itself on another. Delayed hypersensitivity to endotoxin is acquired very early in life and is virtually ubiquitous among most mammals. A reaction comparable to the Shwartzman reaction can be produced if a tuberculin sensitized guinea pig is challenged intradermally with purified protein derivative (PPD). In this case, PPD appears totally unrelated to endotoxin since intravenous injection of PPD into a nontuberculin sensitized guinea pig does not produce any febrile reaction.[6] Gram negative endotoxin is used for the secondary intravenous challenge approximately twenty-four hours later when the induration of the tuberculin reaction has developed. Hemorrhagic necrosis appears at the site of the tuberculin reaction within a few hours, and pathologically it is essentially identical to the classical Shwartzman reaction. Although presumably there is no antigenic relationship between PPD and endotoxin, a common factor is that both individual reactions are in part delayed hypersensitivity in nature, and one reaction is being superimposed on the other.

Since delayed type hypersensitivity against myelin protein appears to be one of the principle pathogenetic mechanisms for experimental allergic encephalomyelitis, and also has been suggested as a possible significant etiological factor in multiple sclerosis, a possible explanation for worsening of multiple sclerosis during bacterial infections can be proposed.[7] If the perivascular mononuclear cell infiltration seen in acute lesions within the white matter of the central nervous system in multiple sclerosis represents a delayed hypersensitivity reaction to myelin, it would be basically similar to the predominant mononuclear cell infiltration in a tuberculin reaction. Endotoxin entering the systemic circulation from a bacterial infection might then enhance the delayed hypersensitivity reaction against myelin in multiple sclerosis by a mechanism resembling the Shwartzman reaction. Such a mechanism would explain particularly the often dramatic improvement seen in a multiple sclerosis patient when an acute febrile infection is controlled with an antibiotic.[3]

Unfortunately, there is an even more puzzling aspect of multiple sclerosis that is less easily explained — clinical worsening in the absence of obvious infection. It is this fact that not only makes multiple sclerosis a mysterious disease, but bolsters the theory that an active or subacute viral infection of some type is responsible for progression of the clinical disease. Alternative explanations have been proposed to account for this phenomenon; for example, multiple sclerosis may be the result of a slow viral infection such as occurs in Kuru.[8] Much effort has been expended and some successes have been achieved using this approach.[9] As has been stated earlier, however, it is difficult to explain all features of multiple sclerosis by either an active or subacute viral infection.

Viral Infection

What might be the actual origin of the disease, multiple sclerosis, and what are the causes for its clinical progression? It might be proposed that the most likely triggering mechanism for multiple sclerosis is a viral infection. This could be any viral infection depending on the individual involved and his/her genetic ability to develop immunity to that infection. Other factors related to an individual's response to a viral infection would be the age of the person at the time of first exposure, the route and dose of the exposure, and the physical condition of the individual at the time of exposure. For example, an older teenager or adult having his first exposure to a viral infection might have a much more severe reaction than a child; as a result, the likelihood of postinfectious complications would be increased. A typical circumstance would be an adult having mumps with severe secondary organ involvement compared to the rela-

tively benign clinical mumps in a small child. A longer incubation period for any specific viral infection in any particular individual could permit a greater increase in the ultimate concentration of viral particles when immune elimination of a virus begins. During the incubation period, viral particles will spread into all parts of the body including the nervous system. Thus, when white blood cells become sensitized to the virus, they will be attracted into all parts of the body, also passing through the blood-brain barrier. In this manner, white blood cells (lymphocytes) may gain access to the central nervous system, and equally important, they may then become exposed to myelin protein which has been shown to be antigenically foreign or "not self". Furthermore, the exposure of white blood cells to the myelin would occur when an active sensitization process against the viral infection has been underway. This raises the additional possibility that the virus itself may have an "adjuvant" action thus promoting sensitization of the lymphocytes to the myelin protein. Antigenically unrelated adjuvants (such as Freund's adjuvant) have been used for nearly forty years to enhance sensitization and antibody production in experimental animals to a wide variety of antigens, and have significantly contributed to the study of experimental allergic encephalomyelitis. In this regard, it is interesting to speculate that the increased prevalence rates noted in increasing latitudes from the equator may be the result of a slightly older age of exposure of children to viral infections in those areas; this, in turn, may be related to the climate and hygenic habits of any particular area. Generally, the younger an individual, the more likely permanent immunity will be acquired to an infection without secondary complications, and theoretically, the less likely the infecting agent will act as an "adjuvant" in promoting hypersensitivity to one's own tissues. Finally, the degree of sensitization of an individual to his own myelin protein also will vary according to his/her genetic ability to become sensitized to it. In other words, one's ability to become sensitized to myelin (or any antigen in the environment) depends on specific genetic coding, thus helping to explain the correlations that have been made in histocompatibility studies concerning an increased tendency for individuals with certain histocompatibility antigens to develop multiple sclerosis.[9]

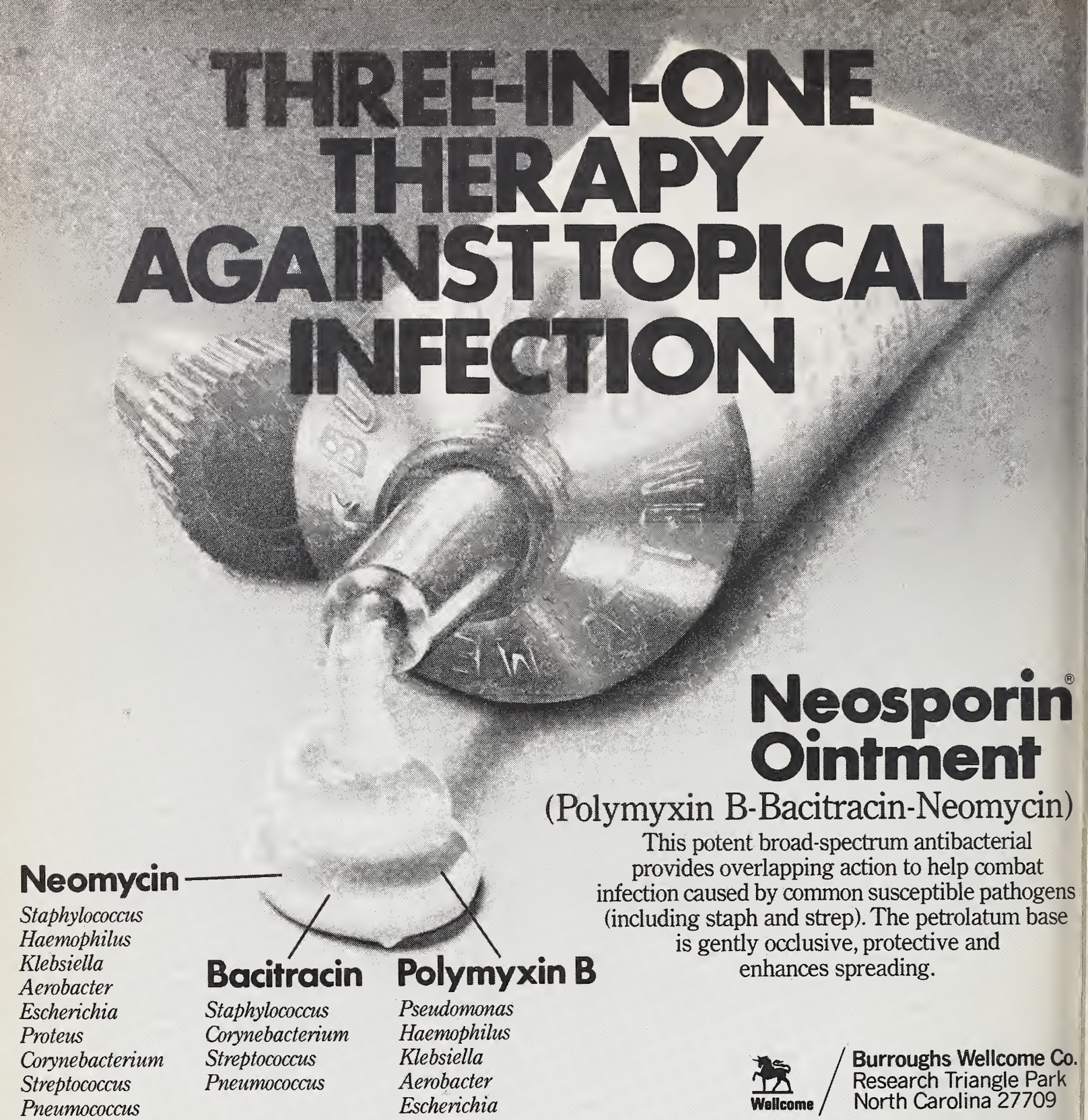
Persisting viral particles or fragments of viruses undoubtedly will remain for a long time or perhaps indefinitely after an infection, but the active viral infection should be finite in duration. That is, further significant replication of the virus within the central nervous system should be extremely limited or essentially nonexistent in most instances. This assumption would be in direct contrast to the mode of progression of the slow viral diseases such as Kuru in which the clinical course is unremitting and fatal. At any rate, for most individuals who ultimately develop clinical multiple sclerosis in their teens through the fourth decade of life, the actual sensitization to their own myelin protein probably occurred years earlier during a viral infection, and quite likely during one of the childhood infections. Rubeola then could be one of the more likely "triggering" infections, and certainly for many, it does create one of the more violent systemic delayed reactions manifested by fever, malaise, and a rash as well as a significant incidence of complicating encephalitis. In context with the above comments, rubeola virus may be a more probable "adjuvant" in enhancing development of sensitization to myelin protein.

It would seem reasonable that the initial sensitization of an individual to his own myelin probably is very low in intensity, because after recovery from a viral infection, most people appear to regain complete health. Furthermore, it is well known that attempts to produce allergic encephalomyelitis using spinal cord antigen without a complete adjuvant is usually very difficult and requires innumerable injections of the challenging antigen. The second developmental stage of multiple sclerosis then begins — at first very slowly and insidiously. Minor symptoms, unrecognizable as early symptoms of delayed hypersensitivity inflammation in the nervous system, might appear coincidentally with or shortly after other acquired bacterial or viral infections. These might include several varied complaints such as scattered aches and pains, a tendency to bump into things while walking, clumsiness of the hands, a transient tingling or numbness particularly in the extremities, headaches, or increasing fatigability.

Endotoxin

Another mechanism for aggravation of multiple sclerosis should be postulated at this point. It is conceivable that individuals may be absorbing small amounts of endotoxin from colon bacteria through their intestinal wall during life. The bowel wall itself is undoubtedly a major barrier against many antigens including bacterial endotoxins, and the large numbers of lymphocytes present in the bowel wall support this contention. Also, the amount of endotoxin present within the small and large bowel is enormous since much of the fecal content is composed of gram negative bacteria. Endotoxin, regardless of the source,

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may have an aggravating effect on the inflammation present in the white matter due to a reaction related to the previously described Shwartzman-like phenomenon. Endotoxin absorbed from the intestinal tract might contribute to the worsening of multiple sclerosis in the absence of obvious infection, and thus explain the "mysterious" progressive nature of the disease when no other overt cause is present.[10]

Although the possibility of intestinal endotoxins affecting health or enhancing disease has not been extensively investigated, several authors have alluded to it. Schaedler and Dubos concluded that the intestinal flora seemed to play a major role in the host's ability to respond to endotoxin and infection.[11] Suter suggested that relatively small amounts of endotoxin contribute to the symptomatology of disease and cause fluctuations of resistance induced by accidental release of endotoxin from the intestine or other areas of gram negative infection.[12] Intestinal endotoxins have been cited as playing a possible etiologic role in the pathogenesis of Reye's syndrome.[13] Back has suggested that bacterial lipopolysaccharide (endotoxin) might enter the circulation from the alimentary canal and act as a triggering mechanism for activating a latent infection or producing a systemic Shwartzman reaction.[10] Furthermore, he has presented several interesting points in evidence proposing that changes in the myelin in multiple sclerosis may be due to inadequate detoxification of lipopolysaccharide or other substances containing lipopolysaccharides. In any event, an inflammatory reaction preexisting within the nervous system may markedly increase the host's susceptibility to endotoxin as shown by Barlow in an experiment in which mice inoculated intracerebrally with lymphocytic choriomeningitis virus were ten thousand times more vulnerable than uninfected animals to a lethal injection of endotoxin given intraperitoneally.[14] During acute multiple sclerosis, an inflammatory reaction characterized by perivascular mononuclear cell infiltration in the central nervous system white matter is common. Abnormal brain scans in acute multiple sclerosis apparently are the result of increased vascular permeability associated with the inflammatory reaction, strongly suggesting that a breakdown of the blood-brain barrier does occur in multiple sclerosis.[15] Additional evidence of a blood-brain barrier defect in multiple sclerosis has been demonstrated at the site of plaques using trypan blue as a supravital dye.[16,17] Thus, endotoxin or the products of its reaction within the body might gain access to the central nervous system more readily in multiple sclerosis victims, and suggests that a mechanism involving a Shwartzman-type reaction would be feasible. Finally, allergic inflammation of the intestinal wall instigated by specific allergenic foods for any one individual might impair the ability of the intestinal wall to prevent absorption of various antigens or endotoxins into the circulation. According to Gruskay and Cooke, children with diarrhea absorb about 0.1% of a test dose of egg albumin orally, whereas approximately 0.02% is absorbed by normal children.[18] In this regard, it may not be merely chance occurrence that Sibley and Foley found gastronintestinal manifestations more frequent in infections temporally related to exacerbations of multiple sclerosis.[4]

Food Allergies

An individual's reaction to any particular food or foods most likely would depend on that person's own unique food allergies. Obviously, a tremendous variety of foods are consumed during a lifetime, and repeated exposures to foods may result in the development of delayed or immediate hypersensitivities to some of those foods or their breakdown products. The appearance of various food allergies may take many years or even decades. Most food allergies may remain subclinical, but as one ages, the likelihood of several allergies to foods becoming more pronounced increases. Rather than recognizing a food allergy, most people simply will feel that one or more foods do not agree with them, and the foods will be avoided. Each time an individual consumes a specific allergenic food, a low grade inflammation of the intestinal wall may develop. Initially, this might manifest itself symptomatically only as indigestion or looseness of the stool several hours later. More importantly, however, the intestinal wall itself will have become a less competent barrier for preventing absorption of breakdown bacterial products including endotoxin into the circulation. Low but significant amounts of endotoxin thus may gain access into the body and gradually exert their adverse effect on the scattered delayed inflammatory areas that had been established previously during a viral infection within the white matter of the central nervous system.

Several observations now might be more readily understood by means of this theory. Some patients actually do seem to have improved on specific diets.[19,20] Furthermore, obese patients often improve by caloric restriction alone, and in these instances caloric restriction probably would limit the number and quantity of allergenic foods that an individual consumes.[6] Any one specific diet would not necessarily improve all patients because each patient has his

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own unique food allergies; for example, if one were allergic to beef but not gluten, a gluten free diet logically would not be beneficial, particularly if that person continued to eat beef.

Another very intriguing point might be raised concerning the aggravating influence of a systemic bacterial infection on multiple sclerosis. In such a circumstance, endotoxin has already gained access to the circulation and can directly exert its aggravating effect upon the inflammatory lesions of multiple sclerosis. On the other hand, when systemic infection is not present, the most likely source of endotoxin would be the intestinal tract, and steroids could have a significant anti-inflammatory effect on the intestinal wall. In this way, steroid therapy might benefit multiple sclerosis by decreasing inflammation and the tendency for absorption of endotoxin through an inflamed bowel wall. Conversely, steroids frequently do not benefit patients when systemic infection is present, but aggravation of multiple sclerosis then is primarily due to endotoxins originating from the infection rather than from the intestinal tract. A further inference might be made concerning the manner in which immunosuppressive therapy using antilymphoblastic globulin stabilizes or possibly improves multiple sclerosis as has been reported by some investigators.[21] While receiving ALG therapy, a patient continues to eat a variety of foods. White blood cells sensitized to the allergenic foods consumed by the patient may then become more accessible to the cytotoxic effects of ALG by leaving the lymph nodes and migrating to the bowel wall where contact can be made with the food allergens. In turn, destruction of these lymphocytes could result in the creation of tolerances to the specific allergic foods, less intestinal wall inflammation, and less absorption of endotoxin. Yet, even these patients become worse when systemic infection is present, confirming the fact that the delayed hypersensitivity inflammatory reaction within the nervous system is still present and can be aggravated by circulating endotoxin. It is well known that most immediate-type allergic reactions respond readily to steroid therapy, but not as well as immediate-type reactions. Because of this, it would be reasonable to assume that the beneficial effect often observed in multiple sclerosis from steroid therapy is not the result of the anti-inflammatory effect on the delayed hypersensitivity reaction in the central nervous system which is "hidden" behind the blood-brain barrier, but rather by the suppression of inflammation in the more readily accessible bowel wall and a corresponding decrease in absorption of endotoxin. In other words, improvement resulting from steroid therapy is actually a secondary rather than primary effect.

Other interesting observations noted in patients with multiple sclerosis might be explained on the basis of chronic absorption of endotoxin from the intestinal tract. Endotoxin is a very potent vasoconstrictor, particularly of superficial blood vessels by both a central action on the hypothalamus, as well as a direct action on the blood vessels. In systemic infection, superficial vasoconstriction resulting from circulating endotoxin prevents blood carrying body heat from reaching the skin surface. Thus, heat essentially becomes trapped internally and a fever results. Even during a fever, it is not uncommon for patients to have very cool distal extremities.[6] Although much lower levels of circulating endotoxin may not cause systemic fever, they probably do cause a restriction of circulation in the hands and feet in a fairly symmetrical distribution. This could explain not only the very common complaint of "cold hands and feet" in a multiple sclerosis patient, but the frequent finding of a mild peripheral neuropathy that cannot be readily explained by a more central lesion. The fact that the hands and feet warm and sensation often improves during steroid therapy helps support the speculation that endotoxin absorption from the intestinal tract has been decreased.

Summary

It is proposed that multiple sclerosis is "triggered" by a viral infection from which an individual appears to recover completely, but an initially benign delayed hypersensitivity to myelin protein remains within scattered areas of the central nervous system. Subsequent progression of multiple sclerosis results primarily from repeated Shwartzman-like reactions within these scattered areas which gradually increase in intensity proportional to the inflammatory cellularity in the areas. Endotoxins or other delayed allergens to produce these reactions can gain access to the circulation either from infections within the body or through an inflamed bowel wall that has been induced principally by food allergens. Intermittent specific infections may account for many of the early exacerbations which are so characteristic of the disease. The more chronic progression might be attributed to the almost continual absorption of endotoxins from the intestinal tract, and this probably increases as food sensitivities become more pronounced with age. Steroids and other immunosuppressive therapies exert their main beneficial effect by making an individual more tolerant to certain foods

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which may be producing the allergic inflammation of the intestinal wall. In turn, steroids may have a rebound effect by making the patients feel better and improve their appetite, which eventually results in the patient eating more of the unrecognized allergenic foods, gaining weight, and worsening clinically.

Conceivably, if a nonallergenic diet could be determined for each individual patient, the need for steroid therapy could be eliminated and improvement still be obtained. Of course, this assumes that all secondary infections are controlled promptly also. It would be interesting to speculate that a hypoallergenic synthetic diet such as is commercially available in the form of Vivonex from Eaton Laboratories might bypass food allergies or be used to help establish an elimination diet.

This paper has been intended primarily to formulate a concise theory for the etiology and progression of multiple sclerosis, incorporating both recent as well as long known facts related to multiple sclerosis. Multiple sclerosis research has been characterized by projects which reach out into a multitude of directions, but because of the extremely complex nature of the disease, the relationship of virology and bacteriology, immunology, chemistry, pathology, and the clinical disease itself have been difficult to piece together. Hopefully, the thoughts presented here may add to the development of further avenues for multiple sclerosis research as well as an understanding of the mystery of multiple sclerosis.

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THREE YEAR APPROVED Psychiatric Residency Program now appointing for an immediate unexpected opening and for July, 1979. Small intensive psychiatric hospital, JCAH approved, affiliated with University of Iowa Medical College. Comprehensive program including two adult psychiatric units, adolescent unit, childrens unit, alcohol & drug abuse unit, with innovative community liaison, and OPD. Eclectic approach. Situated in picturesque northeast Iowa near large cities with cultural advantages, but in rural setting. Ideal for family living. No financial sacrifice while learning. Top salary: first year $23,478, second year $24,648, third year $25,896; liberal fringe benefits; some housing available. Opportunity to join staff upon completion of training. All applicants must have completed one year in an American approved training program in internal medicine, family practice, or pediatrics or a flexible one year program, including four months in internal medicine. Wirte or call J. T. May, M.D., Superintendent, or B. J. Dave, M.D., Director of Education, Mental Health Institute, Independence, Iowa 50644.

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Book Reviews

HYSTERECTOMY—A COMPLETE UP TO DATE GUIDE OF EVERYTHING ABOUT IT AND WHY IT MAY BE NEEDED. Nancy Nugent. Doubleday & Company. $6.95. 181 pages.

The book is long and contains several case history type presentations. The book I believe attempts to do too many things and gives too much information. Therefore, the patient could be confused by the time she finishes reading this book. There are at least five glowing errors in the book which might confuse the patient. These should be pointed out to any one who reads them. On page 7 the author states a "corpus leutum is needed to provide the preparatory functions that will later be taken over by the placenta (after birth-nourishment and maintenance of the fetus)." This type of erroneous information appears in other places in the book also. Under a discussion of the treatment of endometriosis on page 41 the patient goes into a great deal of detail on the medical management of endometriosis. She begins to discuss progestins and by the time she completes her discussion she states "On the other hand these drugs have been blamed for multiple births, notably the famous Kienast Quintuplets." When used for birth control they have been held responsible for blood clots and even cancer." Obviously whoever did the medical review of the book did not read it very carefully of these glaring errors in the indocrinological information would have been corrected.

In the section in why hysterectomies are performed the author goes into a great deal of discussion on the subject of cancer of the cervix. In her discussion of radiation therapy, the discussion becomes confusing and it would appear the author feels that hysterectomy is a more satisfactory treatment.

Finally in discussing endometrial carcinoma, despite some obvious errors such as over growth of the endometrium being called uterine hyperplasia and the fact that a punch biopsy forceps is used to sample the endometrium on the inside of the uterus, the author ends the discussion of hysterectomy with the statement "when radiation is not performed prior to surgery (and it is omitted only in selected cases) there is a much greater chance that some living cancerous tissue may be left behind or that the operation itself may implant some tissue on previously unaffected parts of the vagina or lower abdomen." Again it is obvious that she is trying to discuss all of the possible types of cancer and is talking about more advanced stages of endometrial carcinoma.

The book, as stated originally, attempts to cover too much information. If a patient reads it the physician should be prepared to answer questions based on inaccurate information noted.

Peter E. Fehr, M.D.
Minneapolis, Minnesota

OPERATIVE UROLOGY—THE KIDNEYS, ADRENAL GLANDS AND RETROPERITONEUM by Bruce H. Stewart, M.D. Williams & Wilkins Company. Price $39.50.

When asked to review *Operative Urology—The Kidneys, Adrenal Glands and Retroperitoneum,* edited by Dr. Bruce H. Stewart of the Cleveland Clinic Foundation, one of the first questions that came to mind was the need for another textbook of operative urology. For example, Glenn's *Urologic Surgery,* Campbell and Harrison's *Urology,* and Flocks and Culp's *Surgical Urology* adequately cover most operative procedures currently performed by urologic surgeons.

Stewart's Operative Urology published in 1975 by the Williams and Wilkins Company of Baltimore, Maryland is a 361 page book with nine contributors which illustrates and describes in detail a large number of operative procedures on the kidneys, adrenals, and supravesical retroperitoneal structures only. Operative Urology which contains 23 chapters, including an excellent chapter on renal transplantation, and over 400 illustrations is more than a step-by-step atlas of operative technique. Indications for surgery, pre-operative studies and care, technical aspects of the operation, special or alternate operative techniques, and post-operative management are thoroughly described. The text is printed in a double-width column for easier reading, and a list of important references appears at the end of each chapter. The line drawings are excellent and accurate, but occasionally the illustrations appear too small for the amount of space allotted, and some may even be unnecessary.

Operative Urology is highly recommended for the practicing urologist and the resident in training but in my opinion would be superfluous if the reader already owned one of the previously mentioned textbooks of operative urology.

Clyde E. Blackard, M.D.
Minneapolis, Minnesota

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The occupational medicine residency, funded by the NIOSH Centers Program, is designed to train physicians in both internal medicine and occupational medicine to be qualified for appointment in major academic medical centers as clinicians, teachers and investigators, or for appointment as staff members of corporate medical departments of major institutions, or for positions in departments of public health. Components of the occupational medicine program include three years of study in internal medicine, one year of study leading to an M.P.H. degree, and one year of advanced study in occupational medicine. An additional optional year as a research fellow is available.

Entry at various levels of training programs may be possible if suitable clinical and/or academic training has been obtained previously.

As residents progress through these programs, they will become eligible for examination by both the American Board of Internal Medicine and the American Board of Preventive Medicine.

Inquiries should be addressed to Earl T. Carter, M.D., Ph.D., Division of Preventive Medicine, Department of Internal Medicine, Mayo Clinic, Rochester, Minnesota 55901.

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